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WATER POLLUTION SURVEILLANCE SYSTEM. ANNUAL COMPILATION OF DATA, 1 OCTOBER 1962-30 SEPTEMBER 1963. VOLUME 5: OHIO RIVER BASIN-TENNESSEE RIVER BASIN

Public Health Service
Washington, D. C.

1963

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OHIO RIVER BASIN
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volume 5

PUBLIC HEALTH SERVICE

Water Pollution Surveillance System

ANNUAL COMPILATION OF DATA

October 1, 1962 • September 30, 1963

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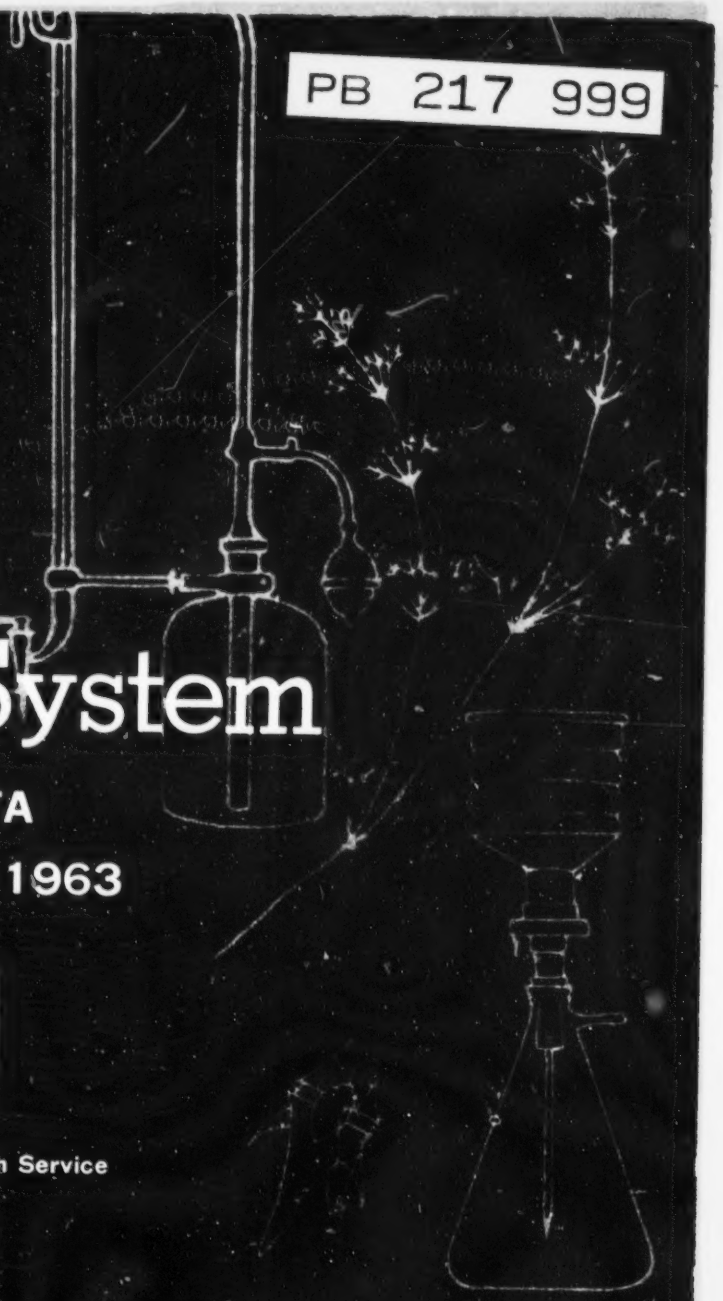

U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE • Public Health Service

OHIO RIVER BASIN
TENNESSEE RIVER BASIN
Volume 5

Public Health Service
Water Pollution Surveillance System

ANNUAL COMPILATION OF DATA
October 1, 1962 - - - September 30, 1963

A Federal, State and Local cooperative report on water pollution surveillance of surface waters at selected locations throughout the United States

U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
Public Health Service, Division of Water Supply and Pollution Control
Washington, D.C. 20201

RELATED PUBLICATIONS:

National Water Quality Network
Annual Compilation of Data, October 1, 1957–September 30, 1958
Public Health Service Publication No. 663 (1958 Edition)

National Water Quality Network
Statistical Summary of Selected Data, October 1, 1957–September 30, 1958
Public Health Service Publication No. 663—Supplement 1

National Water Quality Network
Annual Compilation of Data, October 1, 1958–September 30, 1959
Public Health Service Publication No. 663 (1959 Edition)

National Water Quality Network
Annual Compilation of Data, October 1, 1959–September 30, 1960
Public Health Service Publication No. 663 (1960 Edition)

National Water Quality Network
Plankton Population Dynamics, July 1, 1959–June 30, 1961
Public Health Service Publication No. 663—Supplement 2

National Water Quality Network
Annual Compilation of Data, October 1, 1960–September 30, 1961
Public Health Service Publication No. 663 (1961 Edition)

National Water Quality Network
Annual Compilation of Data, October 1, 1961–September 30, 1962
Public Health Service Publication No. 663 (1962 Edition)

ACKNOWLEDGMENT

To increase the usefulness of the water quality data, annual compilations since 1958, including this one, have presented preliminary and unadjusted flow data for gaging stations at or near most of the Public Health Service Water Pollution Surveillance System sampling points. Final data may be obtained directly from the agency concerned. Any studies using the provisional flow data herein compiled should verify the data prior to completion of reports on such studies. For making the flow information available for this publication, grateful acknowledgment is made by the Public Health Service to:

The International Boundary and Water Commission,
United States and Mexico

The International Joint Commission, United States and Canada

The U.S. Department of the Interior
Bureau of Reclamation • Geological Survey

The U.S. Department of the Army
Corps of Engineers • Lake Survey

FOREWORD

This is the sixth annual compilation of data from the Public Health Service Water Pollution Surveillance System (formerly the National Water Quality Network). During this year, the System was increased from 122 to 128 stations. In order to provide data in a form more useful for local or regional water pollution control officials and their staffs, the present compilation is published in 11 separate volumes. The surveillance data reported herein reveal additional findings on pesticides and other organic chemicals in surface waters and on trends in radioactivity and other areas.

The Public Health Service gratefully acknowledges the assistance to our Surveillance System of the participating local, State and Federal Government agencies and private industry. The success of this program depends, in a large measure, upon their continued interest and support.

GORDON E. MCCALLUM, D. Sc.,
Assistant Surgeon General,
Chief, Division of Water Supply and Pollution Control

VOLUME 1

Northeast Basin

CONNECTICUT RIVER
at Enfield Dam, Conn.
below Northfield, Mass.
at Wilder, Vt.

HUDSON RIVER
below Poughkeepsie, N.Y.

LAKE ERIE
at Buffalo, N.Y.

MERRIMACK RIVER
above Lowell, Mass.

RARITAN RIVER
at Perth Amboy, N.J.

ST. LAWRENCE RIVER
at Massena, N.Y.

VOLUME 2

North Atlantic Basin

DELAWARE RIVER
at Philadelphia, Pa.
at Trenton, N.J.
at Martins Creek, Pa.

POTOMAC RIVER
at Washington, D.C.
at Great Falls, Md.
at Williamsport, Md.

SCHUYLKILL RIVER
at Philadelphia, Pa.

SHENANDOAH RIVER
at Berryville, Va.

SUSQUEHANNA RIVER
at Conowingo, Md.
at Sayre, Pa.

VOLUME 3

Southeast Basin

APALACHICOLA RIVER
at Chattahoochee, Fla.

CHATTAHOOCHEE RIVER
at Columbus, Ga.
at Lanett, Ala.
at Atlanta, Ga.

ESCAMBIA RIVER
at Century, Fla.

ROANOKE RIVER
at John H. Kerr Dam and
Reservoir, Va.

SAVANNAH RIVER
at Port Wentworth, Ga.
at North Augusta, S.C.

TOMBIGBEE RIVER
below Columbus, Miss.

VOLUME 4

Western Great Lakes and Lake Erie Basins

WESTERN GREAT LAKES

DETROIT RIVER
at Detroit, Mich.

LAKE MICHIGAN
at Gary, Ind.
at Milwaukee, Wis.

LAKE SUPERIOR
at Duluth, Minn.

ST. CLAIR RIVER
at Port Huron, Mich.

ST. MARYS RIVER
at Sault Ste. Marie, Mich.

LAKE ERIE BASIN

CUYAHOGA RIVER
at Cleveland, Ohio

MAUMEE RIVER
at Toledo, Ohio

VOLUME 5

Ohio and Tennessee River Basins

OHIO RIVER BASIN

ALLEGHENY RIVER
at Pittsburgh, Pa.

CUMBERLAND RIVER
at Clarksville, Tenn.

KANAWHA RIVER
at Winfield Dam, W. Va.

LITTLE MIAMI RIVER
at Cincinnati, Ohio

MONONGAHELA RIVER
at Pittsburgh, Pa.

OHIO RIVER
at Cairo, Ill.
at Evansville, Ind.
at Louisville, Ky.
at Cincinnati, Ohio
at Huntington, W. Va.
below Addison, Ohio
at Toronto, Ohio

WABASH RIVER
at New Harmony, Ind.

TENNESSEE RIVER BASIN

CLINCH RIVER
above Kingston, Tenn.
at Clinton, Tenn.

TENNESSEE RIVER
at Pickwick Landing, Tenn.
at Bridgeport, Ala.
at Chattanooga, Tenn.
at Lenoir City, Tenn.

VOLUME 6

Upper Mississippi River Basin

ILLINOIS RIVER
near Grafton, Ill.
at Peoria, Ill.

MISSISSIPPI RIVER
at Cape Girardeau, Mo.
at East St. Louis, Ill.
at Burlington, Iowa
at Dubuque, Iowa
at Lock and Dam 3 below St. Paul, Minn.

RAINY RIVER
at Baudette, Minn.
at International Falls, Minn.

RED RIVER (NORTH)
at Grand Forks, N. Dak.

VOLUME 7

Missouri River Basin

BIG HORN RIVER
at Hardin, Mont.

BIG SIOUX RIVER
below Sioux Falls, S. Dak.

KANSAS RIVER
at DeSoto, Kans.

MISSOURI RIVER
at St. Louis, Mo.
at Missouri City, Mo.
at Kansas City, Kans.
at St. Joseph, Mo.
at Omaha, Nebr.
at Yankton, S. Dak.
at Bismarck, N. Dak.
at Williston, N. Dak.

NORTH PLATTE RIVER
above Henry, Nebr.

PLATTE RIVER
above Plattsmouth, Nebr.

SOUTH PLATTE RIVER
at Julesburg, Colo.

YELLOWSTONE RIVER
near Sidney, Mont.

VOLUME 8

Southwest-Lower Mississippi River Basin

ARKANSAS RIVER
at Pendleton Ferry, Ark.
at Little Rock, Ark.
near Forth Smith, Ark.
near Ponca City, Okla.
at Coolidge, Kans.

MISSISSIPPI RIVER
at New Orleans, La.
at Delta, La.
at Vicksburg, Miss.
at West Memphis, Ark.

OUACHITA RIVER
at Bastrop, La.

RED RIVER (SOUTH)
at Alexandria, La.
at Bossier City, La.
at Index, Ark.
at Denison, Tex.

VERDIGRIS RIVER
at Nowata, Okla.

VOLUME 9

Colorado River and Western Gulf Basins

COLORADO RIVER BASIN

ANIMAS RIVER
at Cedar Hill, N. Mex.

COLORADO RIVER
at Yuma, Ariz.
above Parker Dam, Ariz.-Calif.
near Boulder City, Nev.
at Page, Ariz.
at Loma, Colo.

GREEN RIVER
at Dutch John, Utah

SAN JUAN RIVER
at Shiprock, New Mex.

WESTERN GULF BASIN

RIO GRANDE
at Brownsville, Tex.
at Laredo, Tex.
at El Paso, Tex.
below Alamosa, Colo.

SABINE RIVER
near Ruliff, Tex.

VOLUME 10

Pacific Northwest and Alaska Basins

PACIFIC NORTHWEST

CLEARWATER RIVER
at Lewiston, Idaho

COLUMBIA RIVER
at Clatskanie, Oreg.
at Bonneville, Oreg.
at McNary Dam, Oreg.
at Pasco, Wash.
at Wenatchee, Wash.
at Northport, Wash.

PEND OREILLE RIVER
at Albeni Falls Dam, Idaho

SNAKE RIVER
at Ice Harbor Dam, Wash.
at Wawawai, Wash.
at Payette, Idaho

SPOKANE RIVER
at Post Falls Dam, Idaho

WILLAMETTE RIVER
at Portland, Oreg.

YAKIMA RIVER
at Richland, Wash.

ALASKA BASIN

CHENA RIVER
at Fairbanks, Alaska

SHIP CREEK
at Anchorage, Alaska

VOLUME 11
California and the Great Basins

CALIFORNIA BASIN

KLAMATH RIVER
near Keno, Oreg.

SACRAMENTO RIVER
at Greens Landing above Courtland, Calif.

SAN JOAQUIN RIVER
near Vernalis, Calif.

GREAT BASIN

BEAR RIVER
above Preston, Idaho

TRUCKEE RIVER
at Calif.-Nev. Border
at Farad, Calif.

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ANALYTICAL AND FLOW DATA INDEX

STATION	General Description, Trace Elements, Strontium 90	Radioactivity Determinations	Plankton Populations	Organic Chemicals	Chemical, Physical and Bacteriological Analyses	Flow Data	Fish Data
	Page No.	Page No.	Page No.	Page No.	Page No.	Page No.	Page No.
OHIO RIVER BASIN							
Allegheny River							
at Pittsburgh, Pa	25–26	27	28–29	30	31–32	33	—
Cumberland River							
at Clarksville, Tenn	35–36	37	38–39	—	40	41	42–43
Kanawha River							
at Winfield Dam, W. Va	45–46	47	48–49	50	51–52	53	—
Little Miami River							
at Cincinnati, Ohio	55–56	57	58–59	60	61–62	63	—
Monongahela River							
at Pittsburgh, Pa	65–66	67	68–69	70	71–72	73	—
Ohio River							
at Cairo, Ill	75–76	77	78–79	80	81–82	83	—
at Evansville, Ind	85–86	87	88–89	90	91–92	93	94–95
at Louisville, Ky	97–98	99	100–101	102	103–104	105	106–107
at Cincinnati, Ohio	109–110	111	112–113	114	115–116	117	118–120
at Huntington, W. Va	121–122	123	124–125	126	127–128	129	130–132
below Addison, Ohio	133–134	135	136–137	138	139–140	141	—
at Toronto, Ohio	143–144	145–146	148–151	—	147	152–153	—
Wabash River							
at New Harmony, Ind	155–156	157	158–159	160	161	162	—
TENNESSEE RIVER BASIN							
Clinch River							
above Kingston, Tenn	165–166	167	168–169	170	171–172	173	174–175
at Clinton, Tenn	177–178	179–180	182–183	—	184–185	181	186–187
Tennessee River							
at Pickwick Landing, Tenn	189–190	191	192–193	194	195	196	—
at Bridgeport, Ala	197–198	199	200–201	202	203	206	204–205
at Chattanooga, Tenn	207–208	209	210–211	212	213–214	215	216–217
at Lenoir City, Tenn	219–220	221	222–223	224	225	228	226–227

Dash (—) indicates no determination made.

THE PUBLIC HEALTH SERVICE

Water Pollution Surveillance System

The Public Health Service program for providing fundamental information on the quality of the Nation's waters stems from Public Law 660, approved July 9, 1956, as amended by Public Law 87-88, July 20, 1961. Section 4(c) thereof states: ". . . the Secretary (of Health, Education, and Welfare) shall in cooperation with other Federal, State, and local agencies having related responsibilities, collect and disseminate basic data on chemical, physical, and biological water quality insofar as such data or other information relate to water pollution and the prevention and control thereof."

To fulfill this responsibility, the Public Health Service Water Pollution Surveillance System collects, interprets, and disseminates:

a. Information on changes in water quality at key points in river systems, as such quality may be affected by changes in water use and development.

b. Continuous information on the nature and extent of pollutants affecting water quality.

c. Data which will be useful in the development of comprehensive water resources programs.

d. Data which will assist State, interstate, and other agencies in their water pollution control programs, and in the selection of sites for legitimate water uses.

Some 50 sampling stations were established when the program started, October 1, 1957. By September 30, 1963, the number had grown to 128.

Each sampling location satisfies one or more of the following criteria:

a. Major waterways used for public water supply, propagation of fish and wildlife, recreational purposes, and agricultural, industrial, and other legitimate uses.

b. Interstate, coastal, and international boundary waters.

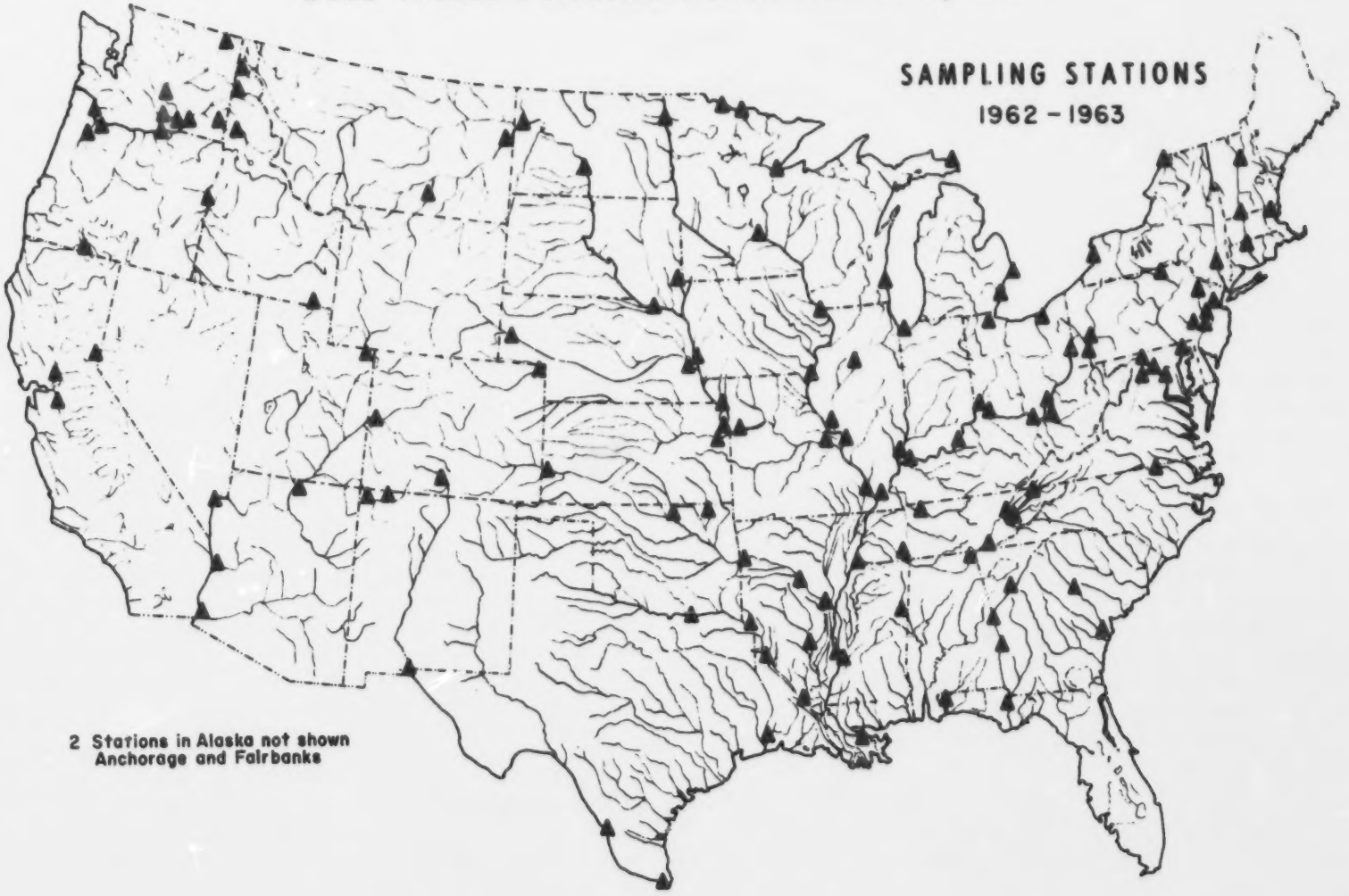
c. Waters on which activities of the Federal Government may have an impact.

Sampling station sites are fixed only after consultation with local, State, Federal and other agencies having related interests.

Active local participation is important in this operation. It assures maximum development of all information valuable both locally and nationally. Program costs are shared by the Federal Government and State and local agencies, those of the latter through contributions of laboratory and sampling manpower. Specifically, the State and local agencies perform certain of the conventional chemical analyses and collect samples for the newer, more complex examinations. The Public Health Service, in turn, performs the more complex determinations and makes the results available to the participants and to the public. In addition, the consultation, training facilities, and other resources of the Public Health Service are available to the cooperating agencies.

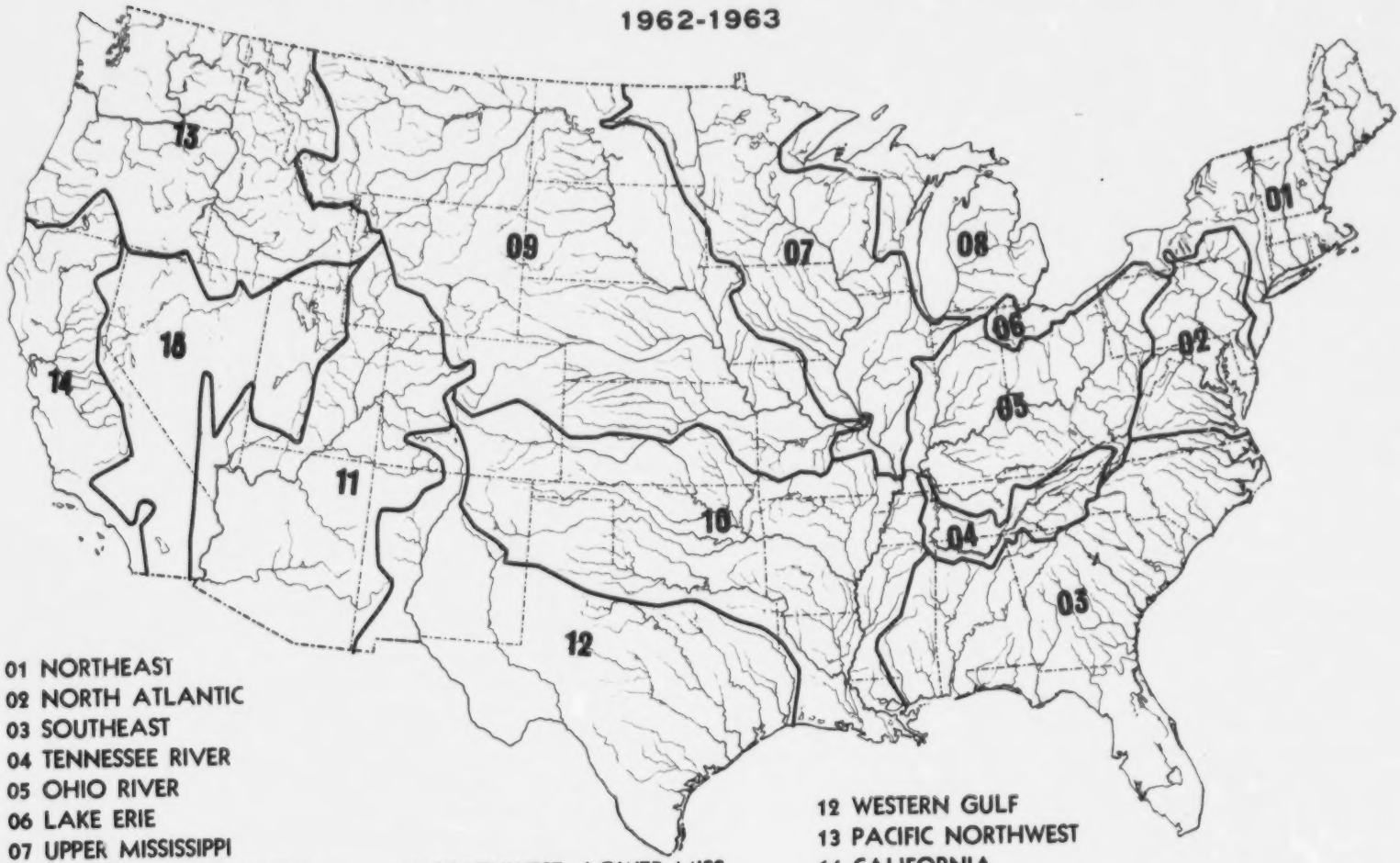
Locations of sampling stations in operation as of September 30, 1963, are shown on page 2. Descriptions of the stations, participating agencies, and other pertinent information are presented with the station data.

PHS Water Pollution Surveillance System



MAJOR RIVER BASINS OF THE UNITED STATES

1962-1963



01 NORTHEAST
02 NORTH ATLANTIC
03 SOUTHEAST
04 TENNESSEE RIVER
05 OHIO RIVER
06 LAKE ERIE
07 UPPER MISSISSIPPI
08 WESTERN GREAT LAKES
09 MISSOURI RIVER

10 SOUTHWEST—LOWER MISS.
11 COLORADO RIVER

12 WESTERN GULF
13 PACIFIC NORTHWEST
14 CALIFORNIA
15 GREAT BASIN

Only after careful screening of needs in water resource development was a pattern set for analyses of water samples.
All System samples are examined for:

a. Radioactivity.
   (1) Gross alpha.
   (2) Gross beta.
   (3) Strontium 90.
b. Plankton populations.
c. Coliform organisms.
d. Organic chemicals.
e. Biochemical, chemical, and physical measurements, including biochemical oxygen demand (BOD), dissolved oxygen (DO), chemical oxygen demand (COD), chlorine demand, ammonia nitrogen, hydrogen ion concentration (pH), color turbidity, temperature, alkalinity, hardness, chloride, sulfate, phosphates and total dissolved solids.
f. Sodium, potassium, fluoride and trace elements.

Samples for groups c and e were collected and analyzed weekly. Samples for organic chemicals were collected and analyzed monthly and plankton organism examinations were conducted semimonthly. Water samples for analysis of suspended and dissolved gross alpha and beta radioactivity were submitted weekly. Strontium 90 analyses were made on composites of weekly samples accumulated over 3-month periods. Sodium, potassium, fluoride, and trace metals were also determined on 3-month composites of weekly samples. New parameters which are developed and found significant will be included as the program continues.

Analytical Methods and Reliability of Data

The physical, chemical and biochemical data documented in this publication are the result of efforts of the cooperating agencies. In general, about half of these measurements were contributed by their laboratories. Specifically, all measurements reported for temperature, pH, DO, BOD, COD, chlorine demand and ammonia nitrogen were performed by the participants at the sample collection point. In addition, about 45 of the participating groups regularly perform all or most of the determinations for the remaining parameters included in the data. Whenever possible, analyses for stable constituents not completed by the participants are completed in the central Water Quality laboratories. While individual laboratories make minor modifications to meet local conditions, the methods used in most cases are those published in the 11th edition, "Standard Methods for the Examination of Water and Wastewater" (22). For uniformity, the chlorine demand test is reported on the basis of the starch-iodide titration procedure, and the chemical oxygen demand test is restricted to the use of 0.025 N reagents.

To assure continued reliability in the published data, frequent analysis of reference samples are made by each cooperating laboratory as an integral part of the overall program. Periodically a synthetic standard sample is provided to each participant for reference analysis. The reported results are reviewed. Any significant errors are called to the attention of the reporting laboratory and, after the cause of the errors has been determined, the previously submitted data are either corrected or discarded. From these findings, the analyses reported in this compilation are believed to be accurate to ± 10 percent of the reported values.

The analytical methods used by the Public Health Service laboratories are described in the discussion of water quality parameters which follows, and are covered by references listed in the Bibliography.

Water Pollution Parameters

In the assessment of water pollution, all of the legitimate purposes for which raw waters can be used, and which may be affected by pollution, must be considered. These may range from the minimum requirements for navigation to the ultimate in water quality demanded for certain industrial processing. Standards differ considerably, therefore, according to water use.

For domestic use, water must be free of disease organisms, clear, colorless, taste- and odor-free, and have a relatively low dissolved mineral content. Agricultural water is judged primarily on its mineral content, especially with respect to the ratio of sodium to other cations, and the presence of boron. Water for fish propogation and recreational purposes must be relatively free from domestic and industrial pollution and must be able to sustain an active flora of the smaller aquatic organisms on which fish and wildlife feed. Industrial water quality demands run the gamut from the complete absence of minerals to a requirement of low temperature, the critical factor in water used for cooling. The effects of radioactive materials on these uses have not yet been fully appraised.

The various laboratory examinations made as part of this program are discussed below.

Radioactivity

Radioactivity, long recognized as a water contaminant from natural sources, has continued to grow in importance and health significance with the development of nuclear energy for both military and peaceful uses. Consequently, levels must be measured continually as new sources are established.

Gross alpha and beta measurements are made on both suspended and dissolved solids in the raw surface water samples. The total radioactivity in the dissolved solids provides a rough measure of the levels which may be found in a treated water, where water treatment removes substantially all of the suspended matter.

Beta activity levels generally reflect the variable contamination resulting from fallout and discharges from nuclear energy installations, institutions utilizing radioactive materials, and other manmade sources. The trend of gross beta radioactivity in samples received from 47 of the Public Health Service Water Pollution Surveillance System stations operating since 1957 is presented in Figure 1. During the first three quarters of the 1962 water year, renewed weapons testing resulted in a rise in gross beta radioactivity in surface waters of the United States. During the sec-

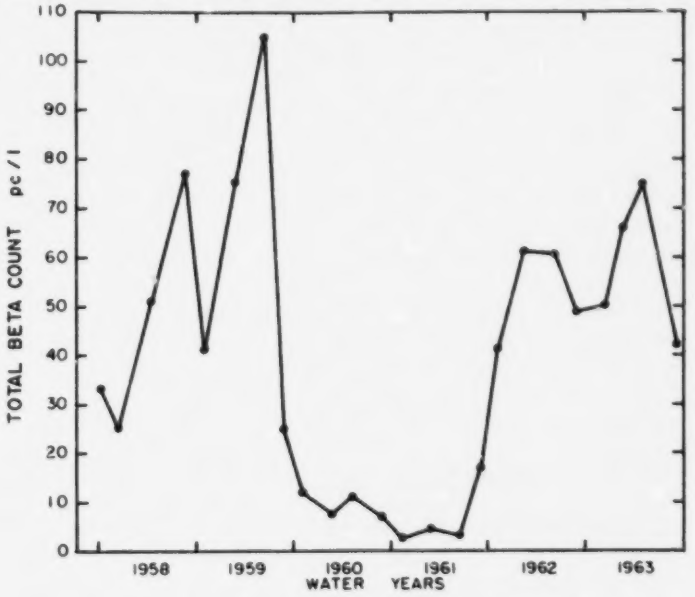


FIGURE 1. GROSS BETA RADIOACTIVITY IN THE SURFACE WATERS OF THE UNITED STATES.

ond and third quarter of water year 1963, the national average activity reached a maximum of 75 pico curies per liter and then decreased. Beta levels have remained well below the Public Health Service Drinking Water Standard of 1,000 pc/l or $\mu\mu$c/l (26).

Alpha levels reflect largely the activity added by uranium and thorium daughters. The waters of the United States can be characterized in a general way with respect to gross alpha radioactivity content. Gross alpha levels average less than 1 pc/l in east coast, Appalachian, Great Lakes, and Pacific Northwest States. On the Colorado Plateau, and along the eastern slope of the Rocky Mountains, natural radioactivity, principally from mineral deposits, results in average concentrations of about 20 pc/l.

Gross levels are most informative in ascertaining long-term trends or changes in water quality. By themselves, however, they are of limited value in assessing radiation exposure. Where gross results are consistently over the maximum permissible concentrations for mixed fission products, the identity of the specific radionuclides involved must be established.

Because of its significance in the environment, the concentration of strontium 90 in the total solids is also reported. In water year 1963, strontium 90 levels ranged from 0.4 to 11.3 pc/l. The national average reached a high of 3.8 pc/l during the fourth quarter (July, August, September 1963). Highest levels were in the north-central area of the coterminous United States where the average was approximately 6 pc/l for this quarter. All averages were less than the limit (10 pc/l) specified in the Public Health Service Drinking Water Standards (*26*). The levels of strontium 90 activity in waters of the United States since the first quarter of the 1959 calendar year are presented graphically in figure 2.

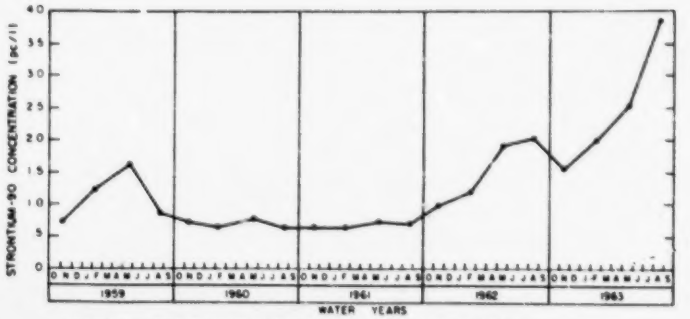


FIGURE 2 STRONTIUM-90 IN SURFACE WATER OF THE UNITED STATES

Plankton Populations

Geographical distribution of algae and other planktonic organisms are influenced by geologic and climatic factors, and result in distinctive plankton populations in different areas. Within each region, population changes are directly related to temperature, and the nature and concentration of organic and mineral substances which enter the aquatic environment. These substances may come from domestic sewage, industrial wastes, runoff from agricultural lands, irrigation discharges, or native rocks and soils. They may be basic nutrients, highly toxic, or metabolically inert. Planktonic organisms differ greatly in their sensitivity to the nutrient and toxic substances which are present. Some thrive only in water which is relatively free of nutrients while others multiply rapidly in water which has been greatly enriched. Large numbers of tolerant algae usually develop in waters containing abundant supplies of inorganic nitrogen and phosphorus resulting from the mineralization of domestic sewage. These nuisance populations may clog filters in municipal water plants, and produce objectional tastes and odors.

On the other hand, plankton populations may be eradicated by the introduction of toxic organic or mineral wastes. This is not desirable because some plankton organisms play essential roles in providing food and oxygen for higher forms of aquatic life, and in cleansing polluted waters.

Beginning at low nutrient levels, progressive enrichment of waters results in an increase in the variety and abundance of the plankton. However, as higher levels of enrichment are attained, the increase in total numbers of organisms is accompanied by a decrease in the number of kinds of organisms. This change is typical in populations which have been subjected to the wide spectrum of substances being introduced into

surface water in ever increasing amounts. Plankton counts, which provide information concerning the variety and abundance of organisms, are useful in detecting changes in the concentration of organic and mineral substances which enter water supplies.

METHODS OF ANALYSIS

Plankton samples are collected semimonthly at each station. A sample consists of 3 liters of raw water taken directly from the stream or from a treatment plant intake. Preservation is effected at the time of collection by the use of 30 ppm merthiolate.

Three types of analyses are performed:

1. Rotifers, crustacea, and other micro invertebrates are removed from a 1-liter aliquot of the sample by settling 24 hours. The sediment is placed in a special slide, 80 x 50 x 2 mm., and the organisms are enumerated under a compound microscope at 100× magnification. The counts are reported as organisms per liter.

2. A "total live algae" count is obtained from 1 milliliter of the sample by scanning two 50-mm. strips on a Sedgwick-Rafter slide using 200× magnification and a Whipple micrometer disc. An appropriate correction factor is used to convert the counts to units per milliliter. Each single cell or natural aggregate of cells (colony) occupying up to 300 square microns (μ^2) is counted as 1 unit. Large colonies are enumerated according to a modified areal-unit method in which aggregates occupying 300–1,000μ^2 are counted as 2 units, those occupying 1,000–2,500μ^2 as 3 units, those 2500–5000μ^2 as 4 units, and those over 5,000μ^2 as 5 units. About 95 percent of cell aggregates fall into size 1 or 2.

3. Identification and proportional census of diatom species are done from sediment obtained by settling 1 liter of the sample 48 hours. A small aliquot of the sediment is placed on a No. 1 coverglass and dried on a warming table. The sediment is ashed on the coverglass by heating on a hotplate, and permanent slides are made with hyrax mounting medium. Counts are made with 90× apochromatic oil immersion objectives and 10× oculars containing a Whipple micrometer disc. Random strip counts are made until the total number of units reaches 200 to 300. The same areal units are used as described for Sedgwick-Ratter counting.

Organic Chemicals

The Nation's water resources continue to receive increasing quantities of organic contaminants. Since 1940 the chemical industry, particularly in the manufacture of synthetic and petrochemicals, has experienced an enormous expansion that shows every sign of continuing. Each year millions of pounds of synthetic detergents, insecticides, herbicides, and similar domestic products find their way into our streams from household sewers, industrial waste discharges, and land runoff.

Effective and economical treatment methods for most of the complex organic materials remain to be developed. Even where treatment exists, residues may remain in sufficient quantity to cause water damage. These stable residues persist through sewage treatment, biological and chemical action of the stream, and water treatment processes, and finally reach the consumer in drinking water.

The presence of some of these materials, even at concentrations considerably less than 1 part per million, may impair water quality, most noticably in production of tastes and odors. Fishflesh tainting, also quickly noticed by the consumer, is another damage. Effects on water treatment, many of which are ill-defined at present, and impairment of water quality for industrial uses are being reported with increasing frequency. Essentially nothing is known of the possible immediate or long-term effects of these materials on human health. Such information is urgently needed.

The usual sanitary analyses are not effective in measuring these newer organic contaminants. Yet it is essential to know something of their concentrations and character. A method known as the "Carbon Adsorption Technique," developed by the Public Health Service, permits the concentration of these organic compounds from a large volume of water. Elution of the adsorbed materials with organic solvents, followed by chemical separation and testing, provides useful information concerning organic pollution and for assaying river systems for these substances.

Following continuous flow of about 5,000 gallons of water through the carbon adsorption column over a 7- to 10-day period at 0.5 gpm, material on the carbon adsorption column is extracted with two solvents, chloroform and alcohol. The residues are weighed. The concentration of these materials in the water sampled is then computed. See Explanation of Analytical Data, page 21.

CHLOROFORM EXTRACTS

The organic residue recovered from the carbon adsorption column by chloroform is very complex. It is desirable to separate the crude extract into certain broad chemical classes, and this can be done on the basis of solubility differences. The various classes or groups and their general significance are discussed briefly below.

Ether Insolubles

This group is usually a brown, humuslike powder, apparently composed to a large extent of carboxylic acids, ketones, and alcohols of complicated structure. Origin of the group, which is an indicator of "old" pollution, is believed to be partially oxidized sewage and industrial wastes. For example, the Ohio River at Cincinnati has been exposed to much industrial and sewage pollution, and hence large amounts of ether insoluble materials are found. Streams with little or no pollution history have little or no ether insolubles. Chloroform extracts contain from 0 to 30 percent of ether insoluble material.

Water Solubles

These substances are largely acidic and undistillable at moderate temperatures, but their solubility in ether indicates that the molecules are smaller and probably simpler than the ether-solubles. On the other hand, their water solubility practically requires the presence of several functional groups, such as hydroxy-acid, keto-acid, and keto-alcohol. Such compounds probably originate from partial oxidation of hydrocarbons or they may be natural substances. They have very little odor. These materials usually make up 10 to 20 percent of the total extract.

Weak Acids

This group is characterized by being removed from ether solution with sodium hydroxide but not with sodium bicarbonate. Phenols are the best known weak acids, and if present in the water, appear in this group. Other weakly acidic compounds include certain enols, imides, sulfonamides, and some sulfur compounds. This group of materials also occurs in nature. The weak acids are odorous, and commonly constitute 5 to 20 percent of the chloroform extract.

Strong Acids

These acids are usually carboxylic acids such as acetic, benzoic, salicylic or butyric. Although classified as strong in reference to carbonic acid, they are actually weak when compared with a mineral acid, such as sulfuric. Many of the compounds are used industrially, but may also be produced by natural processes, such as fermentation. Some of the materials are highly odorous. This fraction makes up from 5 to 20 percent of the total. The significance of the strong acids can be interpreted only in the light of stream pollution conditions.

Bases

These compounds are organic amines. Such materials as aniline and pyridine are amines of commerce. Lower amines may occur as a result of decomposition. Although odorous, the low concentrations found are not likely to cause objectionable conditions. However, in the case of specific amine-containing wastes the compounds can be of considerable significance. Generally, only 1 or 2 percent of the total extract is made up of the bases.

Neutrals

This group frequently constitutes the major portion of the chloroform extract. Neither basic nor acidic, the materials are less reactive and tend to persist in streams longer than many other types. Hydrocarbons, aldehydes, ketones, esters, and ethers are examples of neutral materials. The group lends itself to further fractionation by means of chromatographic separation into aliphatic, aromatic, and oxygenated subgroups:

Aliphatics: This portion represents petroleum type hydrocarbons in a considerable state of purity, and is usually made up of mineral oil type of material. The percentage of aliphatics present yields important information about the possible source of pollution, since petroleum is the most likely source.

Aromatics: These are principally the coal tar hydrocarbons such as benzene, toluene, and a host of others, and their presence in any significant amount is a reliable indication of industrial pollution. Further, the materials can frequently be identified by infrared spectrophotometry. Some aromatic compounds which have been found in our rivers—and in our drinking water—include DDT, aldrin, endrin, dieldrin, phyenyl ether, orthonitrochlorobenzene, pyridine, phenol, and others. The materials are highly odorous, and may also be toxic. Their appearance in any quantity as pollutants should receive careful evaluation.

Oxygenated compounds (Oxys): These are the neutral compounds containing oxygen, such as aldehydes, ketones, and esters. They may have originated by direct discharge or may represent oxidation products from both natural and industrial materials. They help to indicate the "age" of the pollution, since pollution exposed to oxidation forces for a long time would be expected to contain large amounts of oxys. The oxy materials are odorous.

Losses

Manipulative losses inherent in this type of separation may amount to 10 to 15 percent. Losses greater than this may indicate that volatile components were lost from the sample. Such volatiles may have significance as pollutants.

ALCOHOL EXTRACTS

The alcohol extractables generally consist of materials more polar than the chloroform extractables. They often contain synthetic detergents, carboxylic acids and humic materials which may originate naturally or from oxidized products of domestic and industrial wastes. These classes of substances are not quantitatively recovered by the alcohol extraction. For example, this extraction recovers only 20 to 30 percent of the synthetic detergents present. On waters of mixed industrial and domestic pollution, the chloroform and alcohol extractables may be about equal. On some streams where the industrial pollution is rather low and much natural pollution or sewage is present, the alcohol extractables may exceed the chloroform extractables by a factor of 4 to 6.

The alcohol extract is usually only partially soluble in water and most ordinary solvents. Very little further chemical separation of this material is currently practical. However, tests have revealed that synthetic detergents may make up 1 to 12 percent of the alcohol extract.

OTHER TESTS

Infrared spectra are routinely run on the total chloroform and alcohol extracts as well as the neutral, aliphatic, aromatic and oxygenated groups which are usually the most significant. Spectra of other groups are obtained when there is an indication that they may be significant. These spectra reveal something of the chemical structure of the materials, indicate differences and in certain instances provide a definite identification. In the case of the alcohol extracts, the infrared spectra will indicate the presence of synthetic detergents if the materials constitute a significant portion.

Thin layer chromatography has been applied successfully to the resolution of the aromatic and basic fractions of CCE. Gas chromatographic equipment with flame ionization, electron-capture and microcoulometric detectors have also been used freely in the identification of specific substances.

COMPOSITE ANALYSIS

Samples from certain locations have been selected for analysis on a quarterly composite basis. Stations that have collected at least 12 samples in a nearly consecutive manner and averaged 100 ppb. or less of chloroform extractables are selected for such analysis when certain other conditions are met. However, samples falling in this category are analyzed individually when the recovery of the chloroform extract is exceptionally high and/or it is unusual in its infrared spectrum or some other physical characteristic.

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SPECIFIC IDENTIFICATIONS

Information about specific organic substances which were identified in carbon adsorption samples is given on the second page of the group associated with each station. The increased number of pesticide and other specific compounds identified, as compared to previous years, is partly associated with greater sensitivity in analytical methodology and may be partly a reflection of the increasing usage of these substances in the total environment.

Chemical, Physical, and Bacteriological Examinations

The various biochemical, chemical, physical, and bacteriological examinations generally performed by the participating laboratories are discussed below.

AMMONIA NITROGEN AND CHLORINE DEMAND

The cost of water treatment for domestic use is affected by the consumption of chlorine, with ammonia nitrogen being responsible for a large portion of the chlorine demand. The greater this demand, the more expensive is the treatment. The ammonia may originate from unstabilized domestic pollution, from industrial waste discharges, from run-off containing fertilizers used in farming operations or from all three. The presence of measurable quantities of nitrogen compounds, not necessarily ammonia, is also an indication of the fertility of the stream toward both macro- and micro-biological forms.

COLOR

Color in domestic water supplies is undesirable. Its removal in the water treatment process, whether it be from natural or industrial sources, may require large doses of chemicals and be expensive.

DISSOLVED OXYGEN, BIOCHEMICAL AND CHEMICAL OXYGEN DEMANDS

Biochemical processes, in which aquatic organisms attack and stabilize the organic matter present, require dissolved oxygen. If unstable oxidizable organic matter is present in excess, the organisms will multiply rapidly, consuming the oxygen present in the water, and bring about a foul, septic stream condition. The dissolved oxygen level thus serves to indicate the biochemical activity of the stream. High activity, resulting in low dissolved oxygen levels, will drive out game fish in favor of scavengers. Very low or zero oxygen levels will kill all fish and aquatic organisms dependent on dissolved oxygen for life. Temperature and reaeration rates also affect dissolved oxygen levels.

The 5-day biochemical oxygen demand (BOD) indicates the degree of unstabilized organic pollution from either domestic or industrial sources, to which the stream is being subjected. A significant demand will affect the fish and macroorganism population, and waters carrying a high BOD seldom contain game fish. On the other hand, game fish will thrive in streams in which the oxygen demand has been stabilized, as this condition is usually favorable for the growth of organisms on which fish feed.

The chemical oxygen demand analysis serves to support the findings of the biochemical oxygen demand test. It too may indicate to what extent the waste load of the stream has been stabilized, or it may indicate the presence of organic and inorganic pollution which is not readily oxidized by biological processes. Because the chemical oxygen demand can be determined quickly in comparison to the biochemical oxygen demand, the establishment of a correlation between the two parameters serves to reduce the number of the latter determinations required. The chemical demand results are nearly always higher than the biochemical demand.

TEMPERATURE

Temperature is particularly important to conservation and industry. A few degrees elevation in temperature due to cooling water discharges may seriously limit the capacity of a stream to support fish life. Also, high water temperatures increase the cost of cooling water for

industrial operations. Cooling towers and other equipment for handling cooling water must be engineered to the temperature levels normally encountered.

MINERAL CONSTITUENTS

These determinations include alkalinity, hydrogen-ion concentrations (pH), hardness, chlorides, sulfates, and total dissolved solids. The pH indicates whether water is acidic or alkaline, corrosive or passive. Alkalinity is a measure of the neutralization reserve present, or the extent to which the water can resist a change from an alkaline to an acid condition upon addition of acidic chemicals. This information is important to the water treatment plant operator and to many other water users.

Hardness is not only a measure of the soap consuming property, but is also of importance in the treatment of boiler waters, where removal of hardness is one of the most important functions. Chloride, sulfate, and total dissolved solids add further information on the gross dissolved mineral content carried by the stream. These are of great importance when considering the taste or palatability of water. They are also important when the water is being demineralized for specific industrial processes, since the cost of demineralization is a direct function of the dissolved solids content of the water. In addition, waters of high saline content are less desirable and may at times even be unfit for municipal, irrigation, and other uses.

TURBIDITY

Turbidity of water is due to the suspension of clay, silt, finely divided organic matter, microscopic organisms, and other similar materials. Its presence is of particular importance in water treatment processes and in the propagation of fish and other aquatic life.

COLIFORM ORGANISMS

Information about fecal pollution is essential to water quality measurements. Data on coliform bacteria, used as indicators of pollution, help to point up the trends in the effectiveness of treatment of domestic waste discharges.

The delayed-incubation membrane filter technique is used for the coliform examination, instead of the fermentation tube (MPN) method. The latter necessitates transport of water samples to the Water Quality Section laboratory for examination, with a time lapse between collection and examination that can significantly change their microbial content. Also, some of the many other bacteria present in raw water might overgrow or otherwise inhibit the demonstration of the coliform organisms. In the delayed-incubation membrane filter procedure, the bacteria are filtered out from the fluid samples immediately after collection and the filters sent to the Water Quality Section laboratory on a preservative medium. In the laboratory the membrane filters carrying the bacteria are transferred to a medium selective for coliform organisms, then incubated and counted. The resulting counts approach very closely the actual numbers of coliform bacteria present in the water samples at the time of collection.

Unusual populations of coliform bacteria may mean increased pollution and ensuing loss of water quality. The Public Health Service Water Pollution Surveillance System studies and reports the trends in sewage pollution on streams as indicated by the trends of coliform counts.

Trace Elements and Other Determinations

This year's trace element data differ somewhat from data reported in previous compilations in that the manner of obtaining the data has been modified and the program of elements measured altered. The trace metals measurements are now obtained from a 3.4 meter direct reading spectrograph. Tin, antimony, and bismuth have been discontinued; arsenic, boron, phosphorus, aluminum, and strontium have been added. Increased sensitivity for several elements has been attained, especially zinc, manganese, and beryllium, resulting in fewer indeterminate values.

Twice during the year, 3-month composites of the weekly samples were prepared and subjected to analysis. Examinations covered those elements included in the Public Health Service Drinking Water Standards (*26*), and other metals considered to have possible physiological or

toxicological significance. The ultimate goal of this phase of the program is to provide background data on all elements which may be found in water and which may be of significance in water quality management.

In carrying out the spectrographic examination, the sample is first passed through a membrane filter, .045 micron pore size, to remove all suspended matter. An aliquot of sample is then acidified with redistilled nitric acid and evaporated to a concentration containing 100 mg. of dissolved solids in 5.0 ml. A portion of the prepared sample is placed in a porcelain boat and sparked using a rotating disc, with concentrations of the 19 programed elements measured on the direct reader (*12*).

Waters of low dissolved solids content can be concentrated to a greater degree than those having a high dissolved solids content, thus accounting for the variable sensitivity shown in the tabulations. Values followed by an asterisk (*) show the limits of sensitivity at which the test was performed and indicate that the ion being measured was not detected at that level.

It is known that trace concentrations of some ions are subject to precipitation and adsorption on container surfaces during storage. This applies particularly to iron and manganese which are subject to oxidation. Hence, all the values reported by the spectrographic method represent the quantity of metal in solution at the time of analysis to within about 10 percent.

The measurement of sodium and potassium is performed using a flame procedure. Fluoride is determined with the SPADNS reagent using the method described by Bellack and Schouboe (*3*). Boron, previously measured by the curcumin procedure, is now reported from the spectrograph. Measurement of selenium has been eliminated due to the general absence of this element from the samples examined.

The concentrations of surface active agents, reported as alkyl benzene sulfonate (ABS), in the Nation's surface waters is reported for the first time on a number of selected stations. As the capability of determining this pollutant increases, efforts will be made to include all sampling points in the Surveillance System. The data presented here were obtained using a modification of the Standard Methods methylene blue procedure on an automatic analyzer.

The Benthos

Animals and plants that live in or on the bottom substrata of lakes and streams are known as the benthos. This biological community includes such common animals as immature insects, worms, clams, snails, and crustacea. The benthic populations found on a stream bottom are largely determined by the type of substrate. Bottoms consisting of soft silty sediments are normally inhabited by animals that are able to burrow into the sediments and feed on organic detritus in the sediments. These include worms, clams, and certain insect larvae. The number of species is usually small in these habitats. Shallow streams with shoals, rapids, and riffles have more available niches for animals to occupy and the normal benthic fauna usually includes a large variety of organisms.

The benthic populations provide a basic indicator of general water quality. Whereas the plankton organisms move downstream with the current, and fish are able to migrate considerable distances, the benthos is a population relatively fixed on the bottom and the animals are subject to the water flowing over them. The benthic populations will therefore be influenced by the quality of the water.

The animals that make up the benthos have various life cycles. Insects may exist as aquatic larvae living in the bottom for as long as 2 years. They then emerge as adults and mate. The female deposits fertilized eggs into the stream. Some of the class produce young which attach themselves to fish. Some of the worms reproduce asexually. An analysis of the age structure of certain forms in the benthos may provide information on past conditions of the water.

Under conditions of good water quality the benthos should include a variety of species with no one species being present in excessive numbers. If the water should become degraded, certain species in the population, intolerant of the changed environment, will die out; and as the water quality deteriorates, increased numbers of species in the benthos will be eliminated. The one or more species that survive may be able to develop very large populations. Toxic materials in the water or deposited on the bottom may effectively eliminate all bottom life.

At each station where bottom samples are taken an attempt is made to find areas of suitable substrate. From these areas, where pos-

sible, a series of at least six quantitative samples is taken by means of suitable dredges or samplers. In riffles the Surber squarefoot sampler is used. In deep rivers the Ekman or Peterson dredge is used (see Standard Methods, for the Examination of Water and Wastewater, 11th edition, pp. 572–582) (22). A general qualitative collection of invertebrate life is usually made at all stations.

The bottom materials are screened in the field using a screen with 28 meshes to the inch. The concentrated sample is preserved in alcohol and returned to the laboratory.

In the laboratory the sample is transferred to pans and the macroscopic organisms are separated from the sediment and detritus. The animals are then identified as near to species as possible, enumerated, and weighed. Specimens are preserved and retained for future reference.

During this year benthos data were gathered for stations in the Ohio and Tennessee River basins only and are presented with the descriptive material for the appropriate stations. A supplemental analysis of these data will be published separately.

Fish Populations

Fish are a biological end product of the aquatic environment. They are an important source of food, and sport fishing is one of our leading forms of recreation. The maintenance of fish life has been recognized by the Congress, and by States which have protective pollution control legislation, as an important and legitimate use of our Nation's waterways. In other words, in measuring fish populations at Surveillance System stations, we are not measuring a parameter that affects a water use as in the case of other measurements presented in this compilation, but rather a unique parameter that is in itself considered a beneficial water use.

The water quality requirements and tolerance of aquatic life to different types of contaminants vary tremendously. It is this variability in response which makes living aquatic organisms usable indicators of environmental disturbance. Fish require water relatively high in dissolved oxygen, and are intolerant of many chemical and physical contaminants resulting from agricultural, industrial and mining practices. However, the tolerance of different species varies, and man-induced changes of the environment often affect one species more than another, producing imbalanced populations which quite often favor the species less desirable economically.

Moderate amounts of putrescible wastes may enrich the habitat, resulting in great increases in standing crops of fish present. However, under such conditions, the more tolerant and adaptable species may comprise a disproportionate share of the total population, and very sensitive species may be eliminated altogether. The effect of toxic wastes may vary from complete elimination of populations to a reduction in reproductive capacity, growth and resistance to disease and parasitism.

Fish kills are a spectacular and obvious indication that an abrupt change has taken place in the environment. However, because of high mobility resulting in rapid recruitment, the fish population in a river or stream may return to normal levels within a very short time after a kill.

Chronic pollution, to which the fish population must adjust over a period of time, will be reflected in the kinds and relative abundance of the fish species present. In addition to the species composition, the condition of the fish, their growth, reproductive success and certainly their palatability are factors of considerable importance in evaluating the suitability of a body of water for supporting usable stocks of fish.

During the current water year, data on fish populations were gathered for some stations in the Ohio and Tennessee River basins only, and are presented in tables in volume 5 for the appropriate stations.

Fish samples at these stations were collected primarily with rotenone and with an electrofishing device. Five percent emulsified rotenone was applied at suitable sites, where an area of 1 to 3 acres could be blocked off with nets during the rotenoning operation. Such sites were usually in the form of small coves along the shoreline, the mouths of small tributaries, or behind the partial enclosure created by navigational lock walls. An electrical shocking device was used along the shoreline both during the day and at night. In a few cases, samples were also collected with trammel nets and with short, 25-foot haul seines. Sampling with nets and seines was limited because of the paucity of habitat in large rivers which is suitable for using these types of gear.

With each method used sufficient sampling was done to collect as many species present as possible, and to obtain a measure of the relative abundance and size distribution of the various species. Every type of fishing gear is somewhat selective, and the data obtained may not be representative of the actual population composition present in the river at the time of sampling. However, the data obtained by a given method are quantitatively comparable and may be used to evaluate changes in the population composition resulting from natural and man-induced changes in the habitat. Comparisons should be based on samples collected with the same gear, during the same season of the year, and under similar conditions of stream flow and water temperature. These data will be particularly useful in determining the impact of changes in water quality on the fish populations of the Nation's rivers over long periods of time.

For convenience of comparison, the fish in the tables are grouped into six major categories based on food habits and methods of feeding:

I. Large, sight feeding carnivores that feed on other fish. This group includes most game species.

II. Species that feed primarily on insects. This group provides important forage for species in group I.

III. Species that feed primarily on plankton and algae. These also provide important forage for group I species.

IV. Species that feed primarily on mollusks.

V. Omnivores that feed indiscriminately on plant and animal matter from the bottom.

VI. Scavengers that take any available food. Some of the species in this group may sometimes act as predators. The group also includes many important food fish, and species that are tolerant of degraded conditions.

Because foods and feeding habits vary with size, age, and availability of food, there may be considerable overlap between groups. The species listed were grouped according to available literature regarding the main foods of adult specimens of each species.

In the field the total length of the fish was routinely measured to the nearest inch class on a one-half inch interval. Thus a fish in the 5-inch class would measure from 4.5 inches to slightly under 5.5 inches. If the end of the tail touched the dividing line between two length classes, the fish was included in the higher classification. The percent total number and weight are carried to the nearest one-tenth of 1 percent in the tables. The one-tenth of 1 percent was arbitrarily selected for purposes of tabulation, and does not imply such a high level of sampling accuracy.

The fish are listed by common names in the tables according to American Fisheries Society Special Publication No. 2 (1960), A List of the Common and Scientific Names of Fishes From the United States and Canada, Second edition (*1*).

Stream Flow

Stream flow data have a most important role in the utilization of water quality parameters such as are included in this report. For this reason, average daily flow records are reported for most of the sampling stations in the System.

All flow data included in this compilation are *provisional* data furnished by the agencies credited, and are subject to revision by such agencies prior to any final publication. With the exceptions mentioned, the flows are given as furnished to the Public Health Service.

The data were generally furnished in units of cubic feet per second. In general only the first three digits were considered significant. Because of machine limitations the data are reported here in thousand cubic feet per second. Even though three zeros may appear after the decimal, no artificial accuracy of measurement is implied. Only the first three digits should be considered significant. There are two exceptions:

(1) When the flow was over 1 million cubic feet per second, the first four digits are reported, and (2) at times when the Rio Grande flows were extremely low, the data were reported to tenths of a cubic foot per second. These figures are published showing 4 decimal places.

Flow data for sampling stations on the rivers of the Great Lakes system are reported as the monthly mean flow, as computed by the U.S. Lake Survey. In certain other rivers, flow data were computed by the Public Health Service from information supplied by the gaging agency. The methods of computations are shown as footnotes to the data for the applicable stations.

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Explanation of Analytical Data

RADIOACTIVITY DETERMINATIONS

In evaluating radioactivity data it should be noted that the reported errors represent counting errors only and the reported values are subject to other errors commonly associated with gross radioactivity analysis. (See Reference 22.)

A dash (—) in the count column signifies that no determination was made. An asterisk (*) following date of sample indicates that determinations are for composites of two or more samples taken on and before the date shown.

Strontium 90 determinations are reported in micro-microcuries per liter as measured from total solids in the sample composited for the quarter. A dash (—) indicates that no determination was made in that period.

PLANKTON POPULATION

Plankton data are reported on two pages. The first page lists the population size of various groups of algae. A coded number shows the ten most abundant genera of algae and their count level. Code numbers used are identified on page 18. Blank spaces on the data sheets signify that counts of other genera were below a level of 150 per ml. The second page of plankton data lists the four dominant diatom species and their occurrence as a percent of the total diatom population. The percent of occurrence of all other diatom species is shown in the next column. Identification codes of species are given on page 19.

The detectable numbers per ml. of fungi, sheathed bacteria and protozoa are shown in the next two columns. The rotifer and crustacea totals per liter are listed together with the genera where these occurred at a count level of five or more per liter for rotifers and three or more per liter for crustacea. Nematode and miscellaneous animal form counts per liter appear in the last two columns.

A dash (—) indicates that no analysis was made. A zero count of each group is indicated by "0". Blank spaces under abundance and dominance columns indicate that the populations were too few to be included or were absent. Coding for abundant genera of rotifer and crustacea population levels are presented on page 20.

PLANKTON POPULATION

Identification Codes of Algae Genera and Count Levels of Most Abundant Genera

KEY TO COUNT LEVEL (per ml.)

1 150 to 300
2 301 to 600
3 601 to 1,200
4 1,201 to 2,400
5 2,401 to 4,800
6 4,801 to 9,600
7 9,601 to 19,200
8 19,201 to 38,400
9 38,401 and over

Code to ALGAE GENERA (Producers)

Blue-green Algae

01 Agmenellum (Merismopedia)
02 Anacystis (Microcystis)
03 Anacystis
04 Coccochloris
05 Gomphosphaeria
06, 07, 08 Reserve
09 Other genus
10 Other genus

Filamentous blue-greens

11 Anabaena
12 Aphanizomenon
13 Arthrospira
14 Lyngbya
15 Oscillatoria
16 Phormidium
17 Raphidiopsis
18 Spirulina
19, 20, 21 Reserve
22 Other genus
23 Other genus

Coccoid green algae

24 Actinastrum
25 Ankistrodesmus
26 Chlorella-type
27 Chlorococcum
28 Closterium
29 Coelastrum
30 Crucigenia
31 Dictyosphaerium
32 Golenkinia
33 Lagerheimia
34 Micractinium
35 Oocystis
36 Palmellococcus
37 Pediastrum
38 Scenedesmus
39 Staurastrum
40 Tetradesmus
41 Tetrastrum
42, 43 Reserve
44 Other genus
45 Other genus

Filamentous green algae

46 Cladophora
47 Stichococcus
48 Stigeoclonium
49 Reserve
50 Other genus

Green flagellates

51 Chlamydomonas including Carteria
52 Euglena
53 Lepocinclis
54 Pandorina
55 Phacotus
56 Phacus
57 Trachelomonas
58 Reserve
59 Other genus

Other pigmented flagellates

60 Chromulina
61 Dinobryon
62 Gymnodinium
63 Peridinium
64 Reserve
65 Other genus

Diatoms (with chromatophores)

Centric

66 Biddulphia
67 Coscinodiscus
68 Cyclotella
69 Melosira
70 Rhizosolenia
71 Stephanodiscus
72 Other genus

Pennate

73 Achnanthes
74 Amphiprora
75 Amphora
76 Anomoeoneis
77 Asterionella
78 Caloneis
79 Cocconeis
80 Cymatopleura
81 Cymbella
82 Diatoma
83 Diploneis
84 Fragilaria
85 Gomphonema
86 Gyrosigma
87 Navicula
88 Nitzschia
89 Pleurosigma
90 Rhoicosphenia
91 Surirella
92 Synedra
93 Tabellaria
94, 95, 96 Reserve
97 Other genus
98 Other genus
99 Other genus

PLANKTON POPULATION

Identification Code for Diatom Species

No.	Species	No.	Species	No.	Species
01	Achnanthes lanceolata	35	Diatoma elongatum	69	Nitzschia denticula
02	Achnanthes minutissima	36	Diatoma vulgare	70	Nitzschia (Lancelolatae group)
03	Achnanthes sp.	37	Diatoma sp.	71	Nitzschia sp. (first)
04	Amphiprora paludosa	38	Diploneis smithii	72	Nitzschia sp. (second)
05	Amphiprora sp.	39	Diploneis sp.	73	Opephora martyi
06	Amphora ovalis	40	Epithemia turgida	74	Pinnularia sp.
07	Amphora sp.	41	Epithemia sorex	75	Pleurosigma delicatulum
08	Anomoeoneis exilis	42	Epithemia sp.	76	Rhoicosphenia curvata
09	Asterionella formosa	43	Eunotia sp. (first)	77	Rhizosolenia eriensis
10	Bacillaria paradoxa	44	Eunotia sp. (second)	78	Rhopalodia gibba
11	Biddulphia laevis	45	Fragilaria capucina	79	Rhopalodia sp.
12	Caloneis amphisbaena	46	Fragilaria construens	80	Stephanodiscus astraea var. minutula
13	Caloneis sp.	47	Fragilaria crotonensis	81	Stephanodiscus dubius
14	Ceratoneis arcus	48	Fragilaria pinnata	82	Stephanodiscus hantzschii
15	Cocconeis pediculus	49	Fragilaria sp.	83	Stephanodiscus niagarae
16	Cocconeis placentula	50	Frustulia sp.	84	Stephanodiscus sp.
17	Cocconeis sp.	51	Gomphonema olivaceum	85	Surirella brightwelli
18	Coscinodiscus rothii	52	Gomphonema sp.	86	Surirella ovata
19	Coscinodiscus (brackish)	53	Gyrosigma kutzingii	87	Surirella striatula
20	Coscinodiscus sp.	54	Gyrosigma sp.	88	Surirella sp.
21	Cymatopleura solea	55	Hantzchia amphioxys	89	Synedra acus
22	Cymatosira belgica	56	Melosira ambigua	90	Synedra pulchella
23	Cyclotella atomus	57	Melosira distans var. alpigena	91	Synedra nana
24	Cyclotella comta	58	Melosira granulata	92	Synedra ulna
25	Cyclotella kutzingiana	59	Melosira binderana	93	Synedra vaucheriae
26	Cyclotella meneghiniana	60	Melosira islandica	94	Synedra sp.
27	Cyclotella pseudostelligera	61	Melosira italica	95	Tabellaria fenestrata
28	Cyclotella stelligera	62	Melosira varians	96	Tabellaria flocculosa
29	Cyclotella striata	63	Meridion circulare	97	Any entity not found above (first)
30	Cyclotella sp.	64	Navicula cryptocephala	98	Any entity not found above (second)
31	Cymbella ventricosa	65	Navicula sp. (first)	99	Reserved for future entity
32	Cymbella tumida	66	Navicula sp. (second)	xx	Insignificant or population inadequate
33	Cymbella sp.	67	Nitzschia acicularis		
34	Denticula sp.	68	Nitzschia tryblionella		

PLANKTON POPULATION

Identification Codes of Microinvertebrate Genera and Count Levels of Most Abundant Genera

Genera of ROTIFERS
Key to counts per liter

1 5 to 10
2 11 to 20
3 21 to 40
4 41 to 80
5 81 to 160
6 161 to 320
7 321 to 640
8 641 to 1,680
9 1,681 and over

Genera of CRUSTACEA
Key to counts per liter

1 3 to 5
2 6 to 10
3 11 to 20
4 21 to 40
5 41 and over

Code to
MICROINVERTEBRATES

Rotifers

01 Asplanchna
02 Brachionus (also Platyias)
03 Collotheca
04 Cephalodella
05 Chromogaster
06 Euchlanis
07 Filinia
08 Gastropus
09 Hexarthra (also Pedalia)
10 Kellicottia
11 Keratella
12 Lepadella
13 Monostyla (also Lecane)
14 Notholca
15 Philodina and similar contracted bdelloids
16 Ploesoma
17 Polyarthra
18 Pompholyx
19 Proales
20 Rotaria
21 Synchaeta
22 Trichocerca
23 to 45 Reserve
46 Other genus
47 Other genus
48 Other genus
49 Other genus

Cladocerans

50 Nauplii
51 Bosmina and related genera
52 Daphnia and related genera
53 Moina
54 Polyphemus
55 to 72 Reserve
73 Other genus
74 Other genus
75 Other genus

Copepods

76 Cyclops,Euclops, and Paracyclops
77 Diaptomus
78 to 97 Reserve
98 Other genus
99 Other genus

Blank—Insignificant or population inadequate

ORGANIC CHEMICALS

Although units of concentration may be assigned to the values reported herein (µg/l or parts per billion), it is essential that the user of these data consider additional associated information. Introspective examination of the data reported herein has indicated that comparison of concentration values obtained from samples of similar gallonage are more valid than samples of widely differing gallonage. In addition, recent experimental researches have shown that lower flow rates and lower sample volumes than those employed (5,000 gallons at 0.5 gpm) are substantially more efficient and should produce relatively higher concentration values with this method. The first in a series of changes designed to increase sampling efficiency is already underway at Water Pollution Surveillance System stations.

Concentration values reported for specific substances are calculated from quantitative gas chromatographic analysis of the aromatic fractions of CCE. In light of an unknown efficiency of carbon adsorption sampling for these compounds, the reported values represent minima, the actual values being equal to or greater than the reported values.

Zeros when reported have been entered. A dash indicates that the respective results were not reported. An asterisk in the column showing end of sample date indicates that the determinations are for composited samples taken on and before the date shown. The extent of compositing can be determined by examining the gallons filtered, which is the sum of the applicable individual samples immediately above it.

CHEMICAL, PHYSICAL AND BACTERIOLOGICAL ANALYSES

The data entered in each column are as reported. Concentrations of alkalinity and hardness are reported in milligrams per liter as $CaCO_3$. A dash signifies that the particular test was not performed. Zeroes when meaningful have been entered. An asterisk preceding a number should be read as "less than" the number following it.

TRACE ELEMENTS AND OTHER DETERMINATIONS

For a discussion of the sensitivity limits of the determinations performed with spectrographic methods, see page 11.

BASIN 5

OHIO RIVER

The Ohio River basin contains 13 Public Health Service Water Pollution Surveillance System stations. Seven of these stations are on the main stem and there is one station each on the Monongahela, Allegheny, Kanawha, Little Miami, Wabash, and Cumberland Rivers. The Tennessee River which is also tributary to the Ohio, is considered in a subsequent portion of this volume.

The Ohio River is formed by the junction of the Monongahela and Allegheny Rivers at Pittsburgh, Pa., and flows southwesterly to its confluence with the Mississippi River at Cairo, Ill. Rainfall averages about 40 inches per year over the 163,000 square-mile basin. The average annual discharge of over 260,000 cubic feet per second makes the Ohio the largest single tributary to the Mississippi River. Average annual temperatures in the basin vary from about 60° F. in the southwest to 45° F. in the northeast. Navigation is maintained by a series of dams and locks throughout the Ohio and on the Monongahela, Allegheny, Kanawha, and Cumberland Rivers.

Allegheny River: The Allegheny River begins in north central Pennsylvania, flows into New York, reenters Pennsylvania, and meanders southward to Pittsburgh. Oil field brines, acid mine drainage, and mill wastes are discharged to the headwaters of the Allegheny and tributary Kiskiminetas Rivers.

Monongahela River: The headwaters of the Monongahela River are in northern West Virginia, from whence the river flows north to Pittsburgh. Both the Monongahela and its principal tributary, the Youghiogheny, are polluted by acid mine drainage so that pH values as low as 3.2 have been observed.

The Ohio River therefore starts out as an acid stream with low pH values. Municipal and industrial wastes from Pittsburgh and the basic steel industries and additional acid mine drainage are discharged to the upper reach of the river. By the time the Ohio has reached Addison, Ohio, it has established itself as a more typical alkaline stream.

Kanawha River: The Kanawha River drains the central western half of lower West Virginia and enters the Ohio at Point Pleasant, Ohio. In the Charleston area, waste discharges from a large chemical industry complex results in organic, inorganic and thermal pollution.

Preceding page blank

Little Miami River: The Little Miami River is tributary to the Ohio at Cincinnati. Municipal wastes from southwestern Ohio are discharged to this stream.

Wabash River: The Wabash River drains the southern portions of both Illinois and Indiana and enters the Ohio approximately 30 miles below Evansville, Ind.

Cumberland River: The headwaters of the Cumberland River are in the Appalachian Mountains of southern Kentucky and central Tennessee. This river enters the Ohio River several miles above the confluence of the Tennessee River. The Cumberland River has an extensive lock, dam, and reservoir system which influences the flow.

Phytoplankton counts at stations in this basin are generally less than 5,000/milliliter, except at New Harmony on the Wabash River and Cincinnati on the Little Miami River. At these two stations the algae counts are often in excess of 20,000/milliliter during the months, April through October. It is notable that the water at these two stations have higher concentrations of dissolved phosphate, greater hardness and higher pH than at other stations in the basin. The Wabash, especially, has a diverse and abundant summer plankton. In contrast, the Monongahela River provides an unsuitable environment for the growth of most planktonic algae. Its waters are acid and barren except for summer populations of the desmids (Closterium) which grows well in acid waters.

In general, the algae of the basin are dominated by diatoms, but summer pulses of the coccoid green algae, *Scenedesmus, Ankistrodesmus, Actinastrum,* and *Micractinium* contribute substantially to the plankton counts. The main stem of the Ohio River is dominated by the centric diatoms *Melosira ambigua* and *Stephanodiscus hantzschii.* Other abundant centrics in the basin include *Melosira granulata, Cyclotella meneghiniana,* and *C. pseudostelligera.* The most abundant pennate diatom is *Synedra ulna.*

Rotifer populations in excess of 2,000/liter occur in the Ohio and Wabash Rivers during the summer months. The most abundant forms are *Keratella, Brachionus, Polyarthra,* and *Trichocerca.*

The initial sampling for benthic organisms was completed at all Surveillance System stations in the basin during the year. In addition, fish were sampled on the Ohio River at Evansville, Louisville, Cincinnati, and Huntington and on the Cumberland River at Clarksville.

Lists of the fish and preliminary findings from the benthic sampling program are presented with the station data.

ALLEGHENY RIVER AT PITTSBURGH, PENNSYLVANIA

Samples are collected from the intake of the Pittsburgh filtration plant located at the mouth of the Allegheny River.

Water quality at this station is affected by discharges from industries including steel, fabricated steel products, clay, glass, paper, petroleum, food products and stone products.

Exploratory sampling for benthic organisms was conducted on May 9, 1963 and quantitative samples were collected on August 1, 1963. Only a few organisms were found in the samples. The bottom sediments were mixed with deposits of oil and tar-like substances. The river was unable to support a normal benthic population on either the bottom or on attached plants.

Dieldrin was identified in a carbon adsorption method sample from this station.

736-496 O - 64 - 3

Station Location: Allegheny River at Pittsburgh, Pennsylvania

Major Basin: Ohio River

Minor Basin: Allegheny River

Station at: 40°29' Latitude 79°54' Longitude

Miles above mouth: 8

Activation Date: February 8, 1961

Sampled by: Pittsburgh Department of Water

Field Analysis by: Pittsburgh Department of Water

Other Cooperating Agencies: Pennsylvania Department of Health

Hydrologic Data:

Nearest pertinent gaging station: At Natrona, Pennsylvania

Gaging station operated by: U.S. Geological Survey

Drainage area at gaging station: 11,410 square miles

Period of record: 1938 to present

Average discharge in record period: 19,210 cfs.

Maximum discharge in record period: 238,000 cfs.

Minimum discharge in record period: 922 cfs.

Remarks: Flows regulated by operations of 19 upstream reservoirs. Small amount of diversion into Monongahela basin.

ALKYL BENZENE SULFONATE (ABS)

Date	mg/l

ELEMENTAL ANALYSES

		Composite Interval 10/1/62 to 12/31/62	Composite Interval 4/1/63 to 6/30/63
Analysis by wet or flame methods. Results in mg/l	F	.20	.15
	Na	21	12
	K	3.1	1.4
Analysis by Spectrographic methods. Results in micrograms per liter	Zn	100	18
	Cd	*2	*2
	As	95	*22
	B	48	30
	P	*5	11
	Fe	20	8
	Mo	*4	20
	Mn	5	1
	Al	–	*11
	Be	*.05	*.06
	Cu	5	2
	Ag	*.4	*.6
	Ni	*2	8
	Co	*4	*3
	Pb	*5	17
	Cr	*1	6
	V	*2	11
	Ba	21	37
	Sr	137	78

*Actual value is less than the amount shown. Reported result indicates limit of sensitivity at which test was performed. See text for explanation.

STRONTIUM 90 ACTIVITY

Composite Interval	pc/l	±	Composite Interval	pc/l	±
October to December	1.8	.4	April to June	1.8	.3
January to March	–	–	July to September	–	–

± at 95% Confidence Limits

SPECIFIC QUALITATIVE IDENTIFICATIONS FROM CARBON ADSORPTION EXTRACTS WATER YEAR 1962-3

Interval	Compound	Concentration* ug/l
8/10 - 9/3/63	Dieldrin	0.001

*Concentration values, where shown, are calculated from quantitative gas chromatographic analysis of the aromatic fractions of CCE, and may be assigned the units of ug/l. In light of the unknown efficiency of carbon adsorption sampling for these compounds, the reported values represent minima, the actual values being equal to or greater than the reported values.
See page 21.

RADIOACTIVITY DETERMINATIONS

STATE PENNSYLVANIA

MAJOR BASIN OHIO RIVER

MINOR BASIN ALLEGHENY RIVER

STATION LOCATION ALLEGHENY RIVER AT PITTSBURGH, PENNSYLVANIA 79

DATE SAMPLE TAKEN			RADIOACTIVITY IN WATER														RADIOACTIVITY IN PLANKTON					
			DATE OF DETERMINATION		ALPHA						BETA						DATE OF DETERMINATION		GROSS ACTIVITY			
					SUSPENDED		DISSOLVED		TOTAL		SUSPENDED		DISSOLVED		TOTAL				ALPHA		BETA	
MO.	DAY	YR.	MO.	DAY	pc/l	±	pc/l	±	pc/l	±	pc/l	±	pc/l	±	pc/l	±	MO.	DAY	pc/g	±	pc/g	±
10	2	62	11	15	-	-	-	-	-	-	0	7	8	8	8	11						
10	10	62	11	20	-	-	-	-	-	-	8	5	8	8	16	9						
10	17	62	11	14	-	-	-	-	-	-	4	5	15	7	19	9						
10	24	62	11	13	0	0	0	0	0	0	5	2	14	4	19	4						
10	31	62	11	26	-	-	-	-	-	-	5	5	20	7	25	9						
12	26	62	1	21*	0	0	0	1	0	1	4	3	18	4	22	5						
1	30	63	2	19*	0	1	0	1	0	1	9	7	21	8	30	10						
2	27	63	3	20*	0	0	0	0	0	0	4	6	16	7	20	9						
3	27	63	4	16*	1	2	1	1	2	2	51	9	18	7	69	11						
4	24	63	5	24*	1	1	0	1	1	1	21	6	18	7	39	9						
5	29	63	6	21*	0	0	0	1	0	1	7	4	15	5	22	6						
6	26	63	7	24*	0	1	0	1	0	1	14	5	23	7	37	9						
7	31	63	8	23*	0	0	0	0	0	0	4	6	24	9	28	11						
8	28	63	10	1*	0	1	0	1	0	1	1	3	21	6	22	7						
9	23	63	11	6*	0	1	0	1	0	1	9	12	21	16	30	20						

PLANKTON POPULATION

STATE PENNSYLVANIA
MAJOR BASIN OHIO RIVER
MINOR BASIN ALLEGHENY RIVER,
STATION LOCATION ALLEGHENY RIVER AT
PITTSBURGH, PENNSYLVANIA 079

DATE OF SAMPLE			DOMINANT SPECIES OF DIATOMS AND PERCENT OF TOTAL DIATOMS (See text for Codes)									FUNGI AND SHEATHED BACTERIA (Number per ml)	MICROINVERTEBRATES																			
			1ST		2ND		3RD		4TH					ROTIFERS										CRUSTACEA									
															GENERA AND COUNT LEVEL (See text for Codes)											GENERA AND COUNT LEVEL (See text for Codes)							
MONTH	DAY	YEAR	SPECIES	PERCENT	SPECIES	PERCENT	SPECIES	PERCENT	SPECIES	PERCENT	OTHER SPECIES PERCENT		PROTOZOA (Number/ml)	NUMBER PER LITER	1ST GENUS	1ST COUNT LEVEL	2ND GENUS	2ND COUNT LEVEL	3RD GENUS	3RD COUNT LEVEL	4TH GENUS	4TH COUNT LEVEL	5TH GENUS	5TH COUNT LEVEL	NUMBER PER LITER	1ST GENUS	1ST COUNT LEVEL	2ND GENUS	2ND COUNT LEVEL	3RD GENUS	3RD COUNT LEVEL	NEMATODES (Number/liter)	OTHER AERIAL FORMS (Number per liter)
10	2	62	23	54	82	5	70	5	26	4	32	0	0	155	17	5	11	3	16	1	15	1			39	50	4	76	3			2	0
10	17	62	82	14	56	10	23	9	26	8	59	0	0	0											0							0	0
10	31	62	82	48	56	7	92	5	58	4	36	0	0	2											0							0	0
11	21	62	9	17	36	16	82	16	64	9	42	0	0	2											0							0	0
12	5	62	9	42	82	11	2	4	92	3	40	0	0	0											0							0	0
12	19	62										0	0	0											0							0	0
1	9	63										0	0	0											0							0	0
1	23	63										0	0	0											0							0	0
2	6	63										0	0	0											0							0	0
2	27	63										0	0	0											0							0	0
3	6	63												0											-							-	-
3	20	63	36	45	62	19	92	9	65	3	24	-	-	-											-							-	-
4	3	63	92	30	36	25	62	6	46	4	35	-	-	1											0							0	0
4	15	63	27	43	9	6	82	4	92	4	43	-	-	0											0							0	0
5	8	63	82	64	92	7	70	4	51	3	22	-	-	-											-							-	-
5	22	63	82	56	67	9	92	8	91	5	22	-	-	-											-							-	-
6	5	63	82	57	67	11	91	5	36	4	23	-	-	-											-							-	-
6	19	63	27	35	82	27	56	4	67	4	30	-	-	-											-							-	-
8	7	63										-	-	-											-							-	-
8	19	63										-	-	-											-							-	-
9	4	63										-	-	-											-							-	-
9	18	63										-	-	-											-							-	-

PLANKTON POPULATION

STATE PENNSYLVANIA

MAJOR BASIN OHIO RIVER

MINOR BASIN ALLEGHENY RIVER

STATION LOCATION ALLEGHENY RIVER AT PITTSBURGH, PENNSYLVANIA 79

DATE OF SAMPLE			ALGAE (Number per milliliter)									INERT DIATOM SHELLS		MOST ABUNDANT ALGAE - Genera and Count Level per ml. (See text for Codes)																	
			TOTAL	BLUE-GREEN		GREEN		FLAGELLATED (Pigmented)		DIATOMS				1ST		2ND		3RD		4TH		5TH		6TH		7TH		8TH		9TH		10TH	
MONTH	DAY	YEAR		COCCOID	FILAMENTOUS	COCCOID	FILAMENTOUS	GREEN	OTHER	CENTRIC	PENNATE	CENTRIC	PENNATE	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL
10	2	62	100	0	0	30	0	20	0	30	0	0	60																		
10	17	62	300	0	0	60	0	40	0	80	80	0	0																		
10	31	62	1800	40	0	480	0	210	40	660	330	120	120	71	2	51	1	38	1	69	1										
11	21	62	500	0	0	40	20	40	0	120	270	120	40																		
12	5	62	100	0	0	0	0	0	0	0	150	0	0																		
12	19	62	00	0	0	0	0	0	0	20	30	20	60																		
1	9	63	00	0	0	0	0	20	0	20	0	20	30																		
1	23	63	100	0	0	0	0	0	0	0	60	0	60																		
2	6	63	00	0	0	0	0	0	0	0	0	0	0																		
2	27	63	00	0	0	0	0	0	0	0	10	0	0																		
3	6	63	200	0	0	0	0	0	120	0	50	0	80																		
3	20	63	2700	0	0	20	0	0	0	330	2350	200	3260	82	3	92	1	71	1	79	1										
4	3	63	400	0	0	20	0	0	0	20	320	20	210																		
4	15	63	1500	0	0	20	0	20	680	680	110	40	90	65	3	68	2														
5	8	63	300	0	0	20	0	110	0	110	90	0	110																		
5	22	63	200	0	10	10	0	0	0	0	130	0	30																		
6	5	63	400	0	20	150	0	20	0	70	130	20	40																		
6	19	63	1100	0	90	800	0	0	0	110	70	110	90	38	2	25	1														
8	7	63	800	30	30	520	30	0	220	30	0	50	0	38	1	63	1														
8	19	63	700	0	0	460	0	0	240	0	20	70	70	63	1	38	1														
9	4	63	1100	0	0	730	0	40	170	90	110	190	390	38	2	25	1	63	1												
9	18	63	3700	0	0	3530	0	20	70	50	70	50	50	38	5																

ORGANIC CHEMICALS

RECOVERED BY CARBON FILTER TECHNIQUE

RESULTS IN MICROGRAMS PER LITER
(Parts per billion)

STATE PENNSYLVANIA

MAJOR BASIN OHIO RIVER

MINOR BASIN ALLEGHENY RIVER

STATION LOCATION ALLEGHENY RIVER AT PITTSBURGH, PENNSYLVANIA 79

DATE OF SAMPLE BEGINNING			DATE OF SAMPLE END		GALLONS FILTERED	EXTRACTABLES			CHLOROFORM EXTRACTABLES										
											NEUTRALS								
MONTH	DAY	YEAR	MONTH	DAY		TOTAL	CHLORO-FORM	ALCOHOL	ETHER INSOLUBLES	WATER SOLUBLES	TOTAL	ALIPHATICS	AROMATICS	OXYGEN-ATED COMPOUNDS	LOSS	WEAK ACIDS	STRONG ACIDS	BASES	LOSS
10	4	62	10	17	5397	244	92	152	1	25	28	3	2	21	2	10	11	1	16
11	8	62	11	21	4557	174	67	107	1	15	25	6	3	15	1	7	7	1	11
12	7	62	12	19	4991	162	52	110	1	11	26	7	4	14	1	7	4	1	2
1	10	63	1	23	4913	146	45	101	1	7	27	11	5	11	0	5	2	0	3
2	11	63	2	25	4500#	155	84	71	4	18	32	7	5	18	2	14	5	2	9
3	8	63	3	27	5000#	78	44	34	2	5	30	14	6	9	1	3	1	0	3
4	16	63	5	1	5000#	138	59	79	2	13	23	4	3	12	4	6	6	1	8
5	14	63	6	19	5000#	112	45	67	2	13	12	2	1	9	0	5	5	1	
7	1	63	7	26	3712	521	233	288	6	63	52	2	3	43	4	24	33	3	52
8	10	63	9	3	9215#	227	132	95	3	31	34	2	3	27	2	17	23	2	22
9	12	63	9	26	5013	305	122	183	4	26	34	2	2	28	2	15	20	2	21

ESTIMATED

CHEMICAL, PHYSICAL AND BACTERIOLOGICAL ANALYSES

STATE PENNSYLVANIA

MAJOR BASIN OHIO RIVER

MINOR BASIN ALLEGHENY RIVER

STATION LOCATION ALLEGHENY RIVER AT PITTSBURGH, PENNSYLVANIA 79

DATE OF SAMPLE			TEMP. (Degrees Centigrade)	DISSOLVED OXYGEN mg/l	pH	B.O.D. mg/l	C.O.D. mg/l	CHLORINE DEMAND		AMMONIA-NITROGEN mg/l	CHLORIDES mg/l	ALKALINITY mg/l	HARDNESS mg/l	COLOR (scale units)	TURBIDITY (scale units)	SULFATES mg/l	PHOSPHATES mg/l	TOTAL DISSOLVED SOLIDS mg/l	COLIFORMS per 100 ml.
MONTH	DAY	YEAR						1-HOUR mg/l	24-HOUR mg/l										
10	2	62	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	450
10	9	62	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	100
10	16	62	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	14000
10	17	62	17.8	9.2	6.5	1.2	14	.6	6.6	.4	33	21	132	5	10	112	.0	297	-
10	23	62	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	12000
10	30	62	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3500
10	31	62	11.2	11.0	6.8	2.2	10	.3	6.3	.2	36	30	124	10	5	98	.0	284	-
11	7	62	9.0	11.8	6.9	1.4	25	.4	5.9	.2	23	24	96	30	10	78	.0	235	-
11	13	62	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5500
11	14	62	7.0	11.4	6.8	1.5	15	.8	6.2	3.1	20	28	90	20	20	68	.0	156	-
11	20	62	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3300
11	21	62	6.1	11.5	6.7	2.2	21	.6	-	2.7	21	20	82	25	10	64	.0	180	-
11	27	62	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	10000
11	28	62	4.5	12.6	7.0	1.0	26	.6	6.4	2.1	-	21	78	20	5	64	.0	186	-
12	4	62	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	7000
12	11	62	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1000
12	18	62	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1000
12	19	62	7.3	13.6	7.1	1.2	55	.6	6.4	.3	23	20	122	0	5	86	.0	188	-
1	8	63	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	15000
1	9	63	.5	13.2	6.7	.8	47	.6	6.8	2.1	23	24	126	10	5	92	.0	254	-
1	15	63	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	8300
1	16	63	.0	14.0	7.1	.8	44	.6	-	-	23	20	84	10	45	80	.0	192	-
1	22	63	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1500
1	23	63	.0	13.8	7.0	1.2	-	-	-	-	21	18	86	5	8	74	.0	178	-
1	30	63	.0	14.2	7.1	.0	34	-	-	-	19	20	110	5	5	84	.0	232	-
2	6	63	-	13.0	-	1.2	34	-	-	-	-	-	-	0	-	94	.0	235	-
2	13	63	.0	13.8	6.6	.8	29	-	-	.3	32	23	122	0	5	96	.0	232	-
2	26	63	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6400
2	27	63	.0	13.4	6.6	.8	35	-	-	.7	-	23	122	0	5	105	.0	205	-
3	6	63	5.0	13.4	6.3	2.2	29	1.2	2.8	.4	26	9	100	15	70	79	.0	180	-
3	12	63	2.0	12.8	6.8	1.0	44	.6	5.9	.2	18	15	84	10	60	62	.0	151	50
3	20	63	1.0	13.6	6.9	2.4	60	.7	3.0	.2	12	12	50	30	250	32	.0	116	-
3	26	63	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2000
3	27	63	6.0	12.0	6.9	1.0	29	.7	4.9	.1	14	11	50	10	50	32	.1	125	-
4	3	63	9.0	11.0	7.0	.6	49	.7	3.7	.1	15	11	46	0	30	35	.0	98	-
4	10	63	9.0	11.2	6.9	1.4	27	.7	4.8	.1	13	16	58	10	25	46	.0	121	3500
4	17	63	10.0	11.2	7.0	1.4	24	.6	3.6	.2	16	18	76	0	5	48	.0	107	-
4	24	63	10.0	11.2	7.2	1.2	30	2.1	5.8	.2	12	16	56	10	45	42	.0	113	-
4	30	63	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4600

CHEMICAL, PHYSICAL AND BACTERIOLOGICAL ANALYSES

STATE PENNSYLVANIA
MAJOR BASIN OHIO RIVER
MINOR BASIN ALLEGHENY RIVER
STATION LOCATION ALLEGHENY RIVER AT PITTSBURGH, PENNSYLVANIA

DATE OF SAMPLE			TEMP. (Degrees Centigrade)	DISSOLVED OXYGEN mg/l	pH	B.O.D. mg/l	C.O.D. mg/l	CHLORINE DEMAND		AMMONIA-NITROGEN mg/l	CHLORIDES mg/l	ALKALINITY mg/l	HARDNESS mg/l	COLOR (cobalt units)	TURBIDITY (silica units)	SULFATES mg/l	PHOSPHATES mg/l	TOTAL DISSOLVED SOLIDS mg/l	COLIFORMS per 100 ml.
MONTH	DAY	YEAR						1-HOUR mg/l	24-HOUR mg/l										
5	1	63	10.0	11.6	6.9	.8	23	.7	2.8	.1	13	15	66	10	10	51	.0	136	-
5	7	63	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1400
5	8	63	15.0	9.6	6.0	.8	24	1.0	-	.1	16	14	78	10	5	69	.0	210	-
5	13	63	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4000
5	15	63	17.0	9.4	6.9	.7	12	.7	-	.1	16	17	86	5	5	69	.2	181	-
5	21	63	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2800
5	22	63	12.0	8.4	6.0	.8	8	.9	-	.1	18	6	104	0	3	90	.0	208	-
5	29	63	17.0	9.0	6.9	.6	9	.2	-	.1	21	15	88	0	5	65	.0	171	-
6	5	63	18.0	9.0	6.9	1.2	9	.4	-	.1	22	16	88	0	10	70	.0	192	-
6	11	63	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	300
6	12	63	23.0	8.4	6.9	.6	9	.9	1.5	.2	23	15	94	0	15	74	.0	202	-
6	18	63	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	8300
6	19	63	25.0	8.6	7.0	1.2	9	.9	2.0	.1	24	17	92	5	5	84	.0	226	-
6	25	63	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	700
6	26	63	24.0	8.4	7.0	-	9	1.3	2.9	1.0	25	18	94	0	10	82	.0	243	-
7	2	63	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2600
7	3	63	27.0	-	6.8	-	-	2.0	-	.1	25	13	114	15	25	98	.0	265	-
7	9	63	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	600
7	10	63	25.0	7.9	5.0	.7	6	.2	2.4	-	28	3	146	25	2	140	.0	304	-
7	16	63	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	10000
7	17	63	24.0	8.0	6.9	1.4	11	.3	3.4	-	31	10	134	0	5	110	.0	264	-
7	23	63	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2900
7	24	63	25.0	7.0	6.2	1.0	8	.3	-	.5	33	8	170	0	5	138	.0	329	-
7	30	63	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3200
7	31	63	27.0	7.4	7.1	1.4	12	.2	4.4	.4	42	18	162	0	10	130	.0	321	-
8	6	63	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2500
8	7	63	27.0	7.2	6.7	.7	6	.3	5.9	.4	44	13	160	0	10	130	.0	352	-
8	13	63	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	100
8	14	63	25.0	7.4	6.7	1.2	-	.5	6.9	.4	43	10	160	0	5	144	.0	370	-
8	21	63	23.0	8.0	6.9	1.4	7	.5	5.9	.5	40	14	160	35	5	124	.0	385	-
8	27	63	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1700
8	28	63	24.0	7.6	6.8	1.1	12	.4	6.7	.4	39	12	168	3	10	-	.0	368	-
9	3	63	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	900
9	4	63	25.0	7.4	6.8	.6	12	.5	7.9	.6	-	11	168	0	7	155	.0	364	-
9	10	63	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	7000
9	11	63	23.0	7.6	6.8	.8	7	.5	7.2	.6	39	12	180	0	8	155	.0	376	-
9	17	63	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6000
9	18	63	21.0	8.0	6.9	1.2	12	-	-	.6	42	13	184	0	7	178	.0	398	-
9	24	63	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6700
9	25	63	20.0	8.6	7.1	2.4	19	.3	7.9	.4	46	19	184	0	8	178	.0	374	-

STREAM FLOW DATA - 1962-1963

Thousand Cubic Feet per Second

PROVISIONAL--SUBJECT TO REVISION

Gaging Station at Natrona, Pennsylvania
Operated by U.S. Geological Survey

STATE Pennsylvania

MAJOR BASIN Ohio River

MINOR BASIN Allegheny River

STATION LOCATION Allegheny River at Pittsburgh, Pennsylvania

Day	October	November	December	January	February	March	April	May	June	July	August	September
1	9.080	14.900	8.080	5.430	6.780	4.590	72.600	15.400	11.200	2.390	3.530	1.660
2	10.500	14.900	7.180	5.180	7.180	4.880	64.900	16.200	10.100	2.820	3.600	1.440
3	9.370	14.400	6.450	5.740	7.600	5.430	55.900	15.400	8.510	3.530	3.530	1.600
4	8.580	12.800	6.320	6.710	8.080	8.340	48.900	14.400	8.580	4.360	3.340	1.670
5	9.230	11.200	6.320	6.980	10.500	21.800	53.100	13.200	8.300	2.990	3.320	2.000
6	8.300	10.500	6.260	6.780	10.800	25.100	47.500	11.200	8.010	2.730	3.250	2.140
7	7.940	9.740	6.450	6.120	11.200	36.600	40.900	11.200	7.730	2.540	2.860	2.200
8	7.530	8.370	6.450	6.320	10.500	50.300	33.400	10.500	7.800	2.460	2.540	1.900
9	7.050	7.730	6.060	6.850	9.740	50.300	28.000	10.100	8.580	2.350	2.310	1.540
10	6.780	7.460	5.740	7.120	9.010	37.000	23.400	9.370	8.080	2.280	2.280	1.820
11	6.260	9.520	5.680	8.150	8.150	35.800	20.700	13.200	9.370	2.170	1.850	1.860
12	5.620	17.200	5.180	11.200	8.220	26.800	17.700	13.200	11.200	2.140	1.540	1.960
13	6.260	21.800	3.800	19.600	8.080	34.600	16.200	13.200	10.500	2.240	1.790	2.460
14	5.620	18.700	3.340	28.600	7.730	47.500	14.900	12.800	9.740	2.060	2.200	2.390
15	5.300	15.400	3.490	32.200	7.320	58.900	13.600	11.600	9.370	1.830	2.060	2.100
16	5.000	13.200	3.580	29.200	6.060	60.400	12.400	10.800	7.120	2.030	2.030	1.960
17	5.000	12.000	4.820	22.900	5.390	59.300	11.600	9.740	5.870	2.390	2.130	2.170
18	4.420	10.500	6.320	17.200	5.060	106.000	12.800	10.100	5.620	2.240	2.260	2.200
19	5.040	10.500	6.780	15.400	5.550	106.000	13.600	9.370	5.120	2.240	1.930	2.100
20	5.490	13.600	7.530	14.900	6.920	106.000	21.900	10.100	4.700	2.420	2.280	2.030
21	5.000	12.400	8.300	13.600	7.250	103.000	38.300	11.600	5.620	3.580	2.420	1.860
22	3.960	12.000	8.870	13.600	6.450	104.000	43.500	12.400	5.300	4.080	2.350	1.760
23	3.960	10.500	9.370	12.400	5.000	98.500	38.300	12.400	4.240	4.700	2.170	1.570
24	4.020	12.800	10.100	10.100	5.060	79.100	34.600	11.600	3.640	4.300	2.030	1.630
25	3.580	13.200	9.740	7.460	4.530	69.400	32.200	10.500	3.690	3.860	1.860	1.830
26	4.190	11.600	9.230	7.050	4.020	80.800	29.800	9.370	3.530	3.250	1.660	1.760
27	5.740	11.600	8.650	7.390	4.190	102.000	25.100	8.870	3.250	2.900	1.870	1.760
28	5.800	10.100	7.800	7.730	4.300	103.000	20.200	9.740	3.110	2.420	1.860	1.930
29	5.740	8.870	7.530	7.730		100.000	17.200	9.370	2.940	2.140	1.760	1.800
30	8.810	8.440	7.050	7.390		95.400	15.800	9.740	2.540	2.610	1.760	1.630
31	14.000		6.120	7.050		84.200		10.500		3.160	1.860	

CUMBERLAND RIVER AT CLARKSVILLE, TENNESSEE

Samples are collected from the intake of the municipal treatment plant approximately 22 miles downstream from the Corps of Engineers Cheatham Dam. This plant serves an estimated 25,000 people.

The city of Nashville discharges municipal wastes, of which about half receives secondary treatment, with a BOD population equivalent of 185,000 into the river about 45 miles upstream. Recreational use of the river includes boating, commercial and sport fishing. The river is also important for commercial clamming. Barge navigation is an additional use of the river.

A variety of benthic organisms were obtained by limited qualitative collecting on September 7, 1962. Identifications of the organisms and analysis of the data are in progress.

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Station Location:	Cumberland River at Clarksville, Tennessee
Major Basin:	Ohio River
Minor Basin:	Cumberland River
Station at:	36°31' Latitude 87°22' Longitude
Miles above mouth:	126
Activation Date:	August 8, 1961
Sampled by:	Clarksville Gas and Water Department
Field Analysis by:	Clarksville Gas and Water Department U.S. Public Health Service
Other Cooperating Agencies:	
Hydrologic Data:	
Nearest pertinent gaging station:	At Dover, Tennessee
Gaging station operated by:	U.S. Geological Survey
Drainage area at gaging station:	16,437 square miles
Period of record:	1937 to present
Average discharge in record period:	24,770 cfs.
Maximum discharge in record period:	201,000 cfs.
Minimum discharge in record period:	414 cfs. (daily)
Remarks:	Flows affected by operations of Old Hickory Lake, Lake Cumberland, Great Falls Lake, Dale Hollow and Center Hill Reservoirs, and of navigation locks and dams.

ALKYL BENZENE SULFONATE (ABS)

Date	mg/l

ELEMENTAL ANALYSES

		Composite Interval 10/1/62 to 12/31/62	Composite Interval 4/1/63 to 6/30/63
Analysis by wet or flame methods. Results in mg/l	F	–	.25
	Na	–	5.7
	K	–	1.3
Analysis by Spectrographic methods. Results in micrograms per liter	Zn	–	49
	Cd	–	*1
	As	–	*9
	B	–	11
	P	–	*4
	Fe	–	6
	Mo	–	*2
	Mn	–	*1
	Al	–	*4
	Be	–	*.02
	Cu	–	4
	Ag	–	*.2
	Ni	–	*1
	Co	–	*1
	Pb	–	*2
	Cr	–	*2
	V	–	*4
	Ba	–	11
	Sr	–	34

*Actual value is less than the amount shown. Reported result indicates limit of sensitivity at which test was performed. See text for explanation.

STRONTIUM 90 ACTIVITY

Composite Interval	pc/l	±	Composite Interval	pc/l	±
October to December	–	–	April to June	–	–
January to March	–	–	July to September	2.0	.4

± at 95% Confidence Limits

SPECIFIC QUALITATIVE IDENTIFICATIONS FROM CARBON ADSORPTION EXTRACTS WATER YEAR 1962-3

Interval	Compound	Concentration* ug/l

*Concentration values, where shown, are calculated from quantitative gas chromatographic analysis of the aromatic fractions of CCE, and may be assigned the units of ug/l. In light of the unknown efficiency of carbon adsorption sampling for these compounds, the reported values represent minima, the actual values being equal to or greater than the reported values.
See page 21.

RADIOACTIVITY DETERMINATIONS

STATE TENNESSEE

MAJOR BASIN OHIO RIVER

MINOR BASIN CUMBERLAND RIVER

STATION LOCATION CUMBERLAND RIVER AT CLARKSVILLE, TENNESSEE 70

DATE SAMPLE TAKEN			RADIOACTIVITY IN WATER												RADIOACTIVITY IN PLANKTON					
			DATE OF DETERMINATION		ALPHA						BETA						DATE OF DETERMINATION		GROSS ACTIVITY			
					SUSPENDED		DISSOLVED		TOTAL		SUSPENDED		DISSOLVED		TOTAL				ALPHA		BETA	
MO	DAY	YR.	MO	DAY	pc/l	±	pc/l	±	pc/l	±	pc/l	±	pc/l	±	pc/l	±	MO.	DAY	pc/g	±	pc/g	±
10	4	62	11	1	-	-	-	-	-	-	3	5	11	6	14	8						
2	25	63	3	18*	1	1	0	1	1	1	13	3	16	3	29	4						
3	19	63	4	22	6	3	0	1	6	3	100	6	39	4	139	7						
4	23	63	5	24*	0	1	0	1	0	1	2	6	9	6	11	8						
5	28	63	6	24*	0	0	0	0	0	0	6	3	14	3	20	4						
6	4	63	7	30	0	0	1	1	1	1	3	6	13	6	16	8						
7	30	63	8	14	0	0	0	1	0	1	14	6	19	7	33	9						
8	27	63	10	8*	0	1	0	1	0	1	3	6	11	7	14	9						
9	10	63	10	31*	1	1	0	0	1	1	6	6	15	7	21	9						

PLANKTON POPULATION

STATE TENNESSEE

MAJOR BASIN OHIO RIVER

MINOR BASIN CUMBERLAND RIVER

STATION LOCATION CUMBERLAND RIVER AT CLARKSVILLE, TENNESSEE 070

DATE OF SAMPLE			DOMINANT SPECIES OF DIATOMS AND PERCENT OF TOTAL DIATOMS (See text for Codes)									FUNGI AND SHEATHED BACTERIA (Number per ml.)	MICROINVERTEBRATES																	
			1ST		2ND		3RD		4TH		OTHER SPECIES PERCENT		PROTOZOA (Identifiable) Number per ml.	ROTIFERS										CRUSTACEA						NEMATODES (Identifiable) Number per liter	OTHER ANIMAL FORMS (Number per liter)
														NUMBER PER LITER	GENERA AND COUNT LEVEL (See text for Codes)										NUMBER PER LITER	GENERA AND COUNT LEVEL (See text for Codes)							
															1ST		2ND		3RD		4TH		5TH			1ST		2ND		3RD			
MONTH	DAY	YEAR	SPECIES	PERCENT	SPECIES	PERCENT	SPECIES	PERCENT	SPECIES	PERCENT					GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL		GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL		
10	4	62	57	34	27	11	26	10	71	7	38	0	0	6	17	1									1						0	0
2	18	63	82	59	57	19	56	4	71	2	16	0	0	1											0						0	0
3	19	63	92	23	36	19	62	11	16	5	42	-	0	0											0						0	0
4	16	63	82	79	57	13	64	3	70	1	4	-	-	2											0						0	0
5	7	63	27	71	57	23	61	2	92	2	2	-	-	-											-						-	-
6	3	63	82	85	57	12	56	1			2	-	-	-											-						-	-
6	4	63	82	94	57	3					3	-	-	-											-						-	-
8	6	63										-	-	-											-						-	-
8	27	63										-	-	-											-						-	-
9	4	63										-	-	-											-						-	-

PLANKTON POPULATION

STATE TENNESSEE

MAJOR BASIN OHIO RIVER

MINOR BASIN CUMBERLAND RIVER

STATION LOCATION CUMBERLAND RIVER AT CLARKSVILLE, TENNESSEE 70

DATE OF SAMPLE			ALGAE (Number per milliliter)										MOST ABUNDANT ALGAE - Genera and Count Level per ml. (See text for Codes)																			
			TOTAL	BLUE-GREEN		GREEN		FLAGELLATED (Pigmented)		DIATOMS		INERT DIATOM SHELLS		1ST		2ND		3RD		4TH		5TH		6TH		7TH		8TH		9TH		10TH	
MONTH	DAY	YEAR		COCCOID	FILAMENTOUS	COCCOID	FILAMENTOUS	GREEN	OTHER	CENTRIC	PENNATE	CENTRIC	PENNATE	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL
10	4	62	200	0	0	0	0	0	0	40	170	0	40																			
2	18	63	1900	0	0	0	0	20	60	1740	80	270	150	71	4																	
3	19	63	100	0	0	0	0	0	0	60	60	20	230																			
4	16	63	2100	0	0	0	0	170	400	1240	340	230	60	71	3	65	2	51	1	88	1											
5	7	63	3700	0	0	20	0	70	0	3610	0	950	90	68	5	69	2															
6	3	63	400	0	0	20	0	40	0	330	0	510	0	71	2																	
6	4	63	900	0	0	80	0	0	40	800	0	710	60	71	3																	
8	6	63	200	0	0	30	0	0	0	120	50	340	70																			
8	27	63	300	0	0	20	0	20	0	180	40	40	20																			
9	4	63	200	0	0	40	0	0	0	40	90	110	90																			

CHEMICAL, PHYSICAL AND BACTERIOLOGICAL ANALYSES

STATE TENNESSEE

MAJOR BASIN OHIO RIVER

MINOR BASIN CUMBERLAND RIVER

STATION LOCATION CUMBERLAND RIVER AT CLARKSVILLE, TENNESSEE 70

DATE OF SAMPLE			TEMP. (Degrees Centigrade)	DISSOLVED OXYGEN mg/l	pH	B.O.D. mg/l	C.O.D. mg/l	CHLORINE DEMAND		AMMONIA-NITROGEN mg/l	CHLORIDES mg/l	ALKALINITY mg/l	HARDNESS mg/l	COLOR (scale units)	TURBIDITY (scale units)	SULFATES mg/l	PHOSPHATES mg/l	TOTAL DISSOLVED SOLIDS mg/l	COLIFORMS per 100 ml.
MONTH	DAY	YEAR						1-HOUR mg/l	24-HOUR mg/l										
10	4	62	-	-	7.7	-	-	-	-	-	5	52	72	0	*25	28	.1	99	-
2	18	63	-	-	7.4	-	-	-	-	-	6	92	108	5	*25	16	.0	180	1000
2	25	63	-	-	7.7	-	-	-	-	-	4	92	108	10	*25	22	.0	135	50
3	19	63	-	-	7.2	-	-	-	-	-	4	64	80	5	270	16	.1	100	-
4	2	63	-	-	7.5	-	-	-	-	-	4	52	76	0	*25	20	.0	100	7000
4	9	63	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	15000
4	16	63	-	-	7.4	-	-	-	-	-	4	44	48	0	*25	21	.0	93	16000
4	23	63	-	-	7.3	-	-	-	-	-	9	48	64	0	*25	21	.0	89	16000
5	7	63	-	-	-	-	-	-	-	-	5	60	88	0	*25	18	.0	126	-
5	28	63	-	-	-	-	-	-	-	-	9	60	76	5	*25	23	.0	111	1100
6	4	63	-	-	-	-	-	-	-	-	4	66	80	0	*25	19	.0	123	-
7	30	63	-	-	-	-	-	-	-	-	5	48	66	0	*25	24	.0	81	500
8	6	63	-	-	-	-	-	-	-	-	5	46	62	5	*25	23	.0	80	1000
8	27	63	-	-	-	-	-	-	-	-	5	40	62	5	*25	21	.0	92	500
9	4	63	-	-	-	-	-	-	-	-	5	66	82	5	*25	23	.0	117	100
9	11	63	-	-	-	-	-	-	-	-	4	60	74	0	*25	23	.0	112	260

STREAM FLOW DATA - 1962-1963

Thousand Cubic Feet per Second

PROVISIONAL--SUBJECT TO REVISION

Gaging Station at Dover, Tennessee
Operated by U.S. Geological Survey

STATE Tennessee

MAJOR BASIN Ohio River

MINOR BASIN Cumberland River

STATION LOCATION Cumberland River at Clarksville, Tennessee

Day	October	November	December	January	February	March	April	May	June	July	August	September
1	6.030	11.200	16.800	24.700	9.310	19.600	55.000	27.300	15.000	9.890	20.000	10.700
2	7.880	8.460	18.800	20.000	10.500	25.400	52.000	27.300	11.300	10.900	22.200	9.400
3	15.400	5.050	15.200	19.600	23.400	27.100	51.200	24.600	9.320	15.000	21.500	8.520
4	13.900	5.230	16.600	15.400	23.100	26.000	49.500	23.900	11.800	14.200	19.800	12.800
5	9.510	7.790	16.300	13.800	21.100	45.500	48.800	15.800	14.500	13.400	18.500	12.900
6	8.480	7.510	15.800	13.700	22.800	69.700	47.300	12.400	13.600	13.700	16.500	11.000
7	7.990	5.720	20.300	14.000	23.500	86.500	45.600	13.200	14.300	12.100	16.900	8.340
8	8.540	4.650	19.500	12.000	18.600	65.700	40.000	16.100	16.300	10.300	18.200	6.830
9	11.100	5.520	16.800	14.900	18.100	42.400	39.000	15.200	15.600	8.800	18.600	7.100
10	8.970	8.700	14.300	13.900	21.000	37.500	38.600	16.100	15.700	11.400	18.400	8.520
11	10.100	16.200	14.100	11.300	22.500	41.400	39.700	17.200	13.000	14.300	15.500	8.800
12	11.800	18.200	16.900	11.900	29.600	84.200	41.400	8.260	15.900	14.800	16.700	8.040
13	14.200	17.900	21.000	18.700	34.200	112.000	41.700	8.870	15.000	15.400	21.600	7.550
14	12.400	16.000	16.200	26.800	29.200	121.000	31.000	14.000	14.200	14.500	18.000	6.960
15	9.750	12.000	18.600	23.900	28.000	105.000	28.600	11.800	18.000	21.000	15.000	7.160
16	9.910	11.100	13.800	16.600	26.000	77.800	26.800	11.000	22.600	14.700	15.700	9.320
17	13.900	13.300	12.800	17.900	22.800	93.700	24.700	12.200	14.400	15.100	16.800	8.840
18	12.900	11.700	11.800	18.500	17.000	113.000	22.500	12.200	12.600	18.200	12.200	5.720
19	8.190	11.400	12.500	12.500	15.600	119.000	20.500	9.040	10.800	20.800	11.700	5.300
20	7.320	14.400	12.600	10.900	17.200	116.000	14.900	8.280	10.400	19.600	9.850	5.740
21	10.000	18.400	10.100	10.700	22.400	108.000	13.300	8.240	15.200	19.300	9.040	5.790
22	7.560	16.600	8.800	12.600	24.600	98.200	12.800	9.500	18.200	15.300	10.100	6.130
23	7.210	18.100	17.000	14.500	20.200	91.200	11.400	8.280	12.000	16.500	16.000	5.790
24	9.370	24.700	19.200	15.700	15.300	86.900	11.000	7.240	8.940	15.400	13.300	6.600
25	17.300	16.700	13.800	17.900	19.200	82.200	10.900	7.980	6.700	15.500	10.700	7.520
26	20.100	11.700	11.700	18.500	21.200	83.800	13.900	7.490	6.130	17.200	11.400	6.110
27	18.500	12.100	15.200	16.400	16.600	81.800	18.700	8.170	7.100	18.400	11.400	5.940
28	19.300	15.300	12.800	11.900	13.300	71.200	18.600	11.000	10.600	17.600	10.900	5.580
29	15.100	17.200	14.000	11.000		65.900	15.700	8.730	9.710	15.400	29.700	5.270
30	12.100	14.500	16.200	10.900		62.500	28.000	10.200	9.690	14.000	38.200	5.140
31	12.900		20.900	10.700		59.500		13.500		15.800	22.600	

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FISH POPULATION

State: Tennessee
Major basin: Ohio River
Minor basin: Cumberland River
Station location: Cumberland River at Clarksville, Tenn.

		Collecting method											
		Rotenone						Electric shocker					
Sampling date(s)		Aug. 26, 1963						Aug. 27, 28, 1963					
Total number of fish		296						342					
Total weight of fish (pounds)		122.5						84.0					
Group	Species collected	Percent of total		Length range (inches) number of fish				Percent of total		Length range (inches) number of fish			
		Number	Weight	0–4	5–8	9–12	Over 12	Number	Weight	0–4	5–8	9–12	Over 12
I	Longnose gar							0.6	0.2				
	White bass	0.7	<0.1	2									
	Largemouth bass	.7	.6		1		1						
	Spotted bass	.7	<.1	2				6.4	4.8				
	Smallmouth bass							.3	.1				
	White crappie	.3	<.1		1								
	Black crappie	.3	<.1		1								
	Sauger	.3	.2		1			.6	.5				
		3.0	.8					7.9	3.6				
II	Mooneye							1.8	1.9				
	Bigeye chub							.3	<.1				
	Emerald shiner	32.0	.4	94				27.8	.5				
	Ghost shiner	.3	<.1	1									
	Spotfin shiner	3.4	<.1	10				1.8	<.1				
	Mimic shiner	.3	<.1	1									
	Pugnose minnow	.3	<.1	1				.9	<.1				
	Bullhead minnow	3.4	<.1	10				1.5	<.1				
	Pirate perch	.7	<.1	2									
	Rock bass							.9	.3				
	Green sunfish							.6	.1				
	Longear sunfish	1.0	.2		3			10.2	2.8				
	Redear sunfish	2.4	.1	7									
	Bluegill	8.4	1.5	5	8			8.5	2.4				
	Greenside darter							.3	<.1				
		52.2	2.2					54.6	8.0				

FISH POPULATION—Continued

State: Tennessee
Major basin: Ohio River
Minor basin: Cumberland River
Station location: Cumberland River at Clarksville, Tenn.

		Collecting method											
		Rotenone						Electric shocker					
Sampling date(s)		Aug. 26, 1963						Aug. 27, 28, 1963					
Total number of fish		296						342					
Total weight of fish (pounds)		122.5						84.0					
		Percent of total		Length range (inches) number of fish				Percent of total		Length range (inches) number of fish			
Group	Species collected	Number	Weight	0–4	5–8	9–12	Over 12	Number	Weight	0–4	5–8	9–12	Over 12
III	Gizzard shad	25.1	6.6	.....	45	27	2	24.8	22.8	.....	.....	.....	.....
	Threadfin shad	.3	<.1	.....	1	.....	.....	.3	<.1	.....	.....	.....	.....
		25.4	6.6	.....	.....	.....	.....	25.1	22.8	.....	.....	.....	.....
IV	Shorthead redhorse	.....	.....	.....	.....	.....	.....	.6	29.8	.....	.....	.....	.....
	River redhorse	.....	.....	.....	.....	.....	.....	.6					
	Black redhorse	.....	.....	.....	.....	.....	.....	2.0					
	Golden redhorse	.3	<.1	1	.....	.....	.....	4.4					
	Ohio redhorse	.....	.....	.....	.....	.....	.....	.3					
	Freshwater drum	9.8	8.0	.....	2	24	3	1.2	1.9	.....	.....	.....	.....
		10.1	8.0	.....	.....	.....	.....	9.1	31.7	.....	.....	.....	.....
V	River carpsucker	.3	.8	.....	.....	.....	1	.....	.....	.....	.....	.....	.....
	White sucker	.7	.9	.....	.....	2	.....	.....	.....	.....	.....	.....	.....
	Spotted sucker	1.7	1.9	2	.....	2	1	.6	1.0	.....	.....	.....	.....
		2.7	3.6	.....	.....	.....	.....	.6	1.0	.....	.....	.....	.....
VI	Carp	5.4	74.1	.....	.....	.....	16	.9	28.1	.....	.....	.....	.....
	Bigmouth buffalo	.3	3.8	.....	.....	.....	1	.....	.....	.....	.....	.....	.....
	Channel catfish	.3	.4	.....	.....	.....	1	.....	.....	.....	.....	.....	.....
	Flathead catfish	.....	.....	.....	.....	.....	.....	.6	.7	.....	.....	.....	.....
	Yellow bullhead	.3	<.1	1	.....	.....	.....	.....	.....	.....	.....	.....	.....
	American eel	.3	.5	.....	.....	.....	1	1.2	2.1	.....	.....	.....	.....
		6.6	78.8	.....	.....	.....	.....	2.7	30.9	.....	.....	.....	.....

KANAWHA RIVER AT WINFIELD DAM, WEST VIRGINIA

Samples are collected at the turbine intake of Winfield Dam Power Plant located approximately 25 miles below Charleston, West Virginia. The Charleston-South Charleston area has a large complex of chemical plants which significantly affect the water at this station.

The infrared spectra of carbon adsorption method samples collected from April through July 1963 showed the presence of nitrile or amine type substances. This is the first observation of these compounds at this station.

Bottom samples collected during summer of 1963 at this station were dominated by oligochaete worms with the occasional occurrences of midge and beetle larvae.

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Station Location: Kanawha River at Winfield Dam, West Virginia

Major Basin: Ohio River

Minor Basin: Kanawha River

Station at: 38°32' Latitude 81°55' Longitude

Miles above mouth: 30

Activation Date: February 24, 1960

Sampled by: West Virginia Division of Water Resources

Field Analysis by: West Virginia Division of Water Resources

Other Cooperating Agencies: Kanawha Valley Power Company
West Virginia State Department of Health

Hydrologic Data:

Nearest pertinent gaging station: At Charleston, West Virginia

Gaging station operated by: U.S. Geological Survey

Drainage area at gaging station: 10,419 square miles

Period of record: 1939 to present

Average discharge in record period: 14,466 cfs.

Maximum discharge in record period: 216,000 cfs.

Minimum discharge in record period: less than 1,030 cfs.

Remarks: Regulated by operations of Clayton, Bluestone and Sutton Reservoirs.

ALKYL BENZENE SULFONATE (ABS)

Date	mg/l

ELEMENTAL ANALYSES

		Composite Interval 10/1/62 to 12/31/62	Composite Interval 4/1/63 to 6/30/63
Analysis by wet or flame methods. Results in mg/l	F	—	.15
	Na	—	17
	K	—	1.7
Analysis by Spectrographic methods. Results in micrograms per liter	Zn	144	116
	Cd	*2	*2
	As	*16	*16
	B	22	29
	P	*4	8
	Fe	16	11
	Mo	*2	20
	Mn	*.8	3
	Al	—	24
	Be	*.04	*.04
	Cu	10	16
	Ag	*.3	.4
	Ni	*2	*2
	Co	*3	*2
	Pb	*4	*4
	Cr	*1	5
	V	*2	16
	Ba	47	37
	Sr	176	194

*Actual value is less than the amount shown. Reported result indicates limit of sensitivity at which test was performed. See text for explanation.

STRONTIUM 90 ACTIVITY

Composite Interval	pc/l	±	Composite Interval	pc/l	±
October to December	1.1	.3	April to June	2.9	.3
January to March	—	—	July to September	—	—

± at 95% Confidence Limits

SPECIFIC QUALITATIVE IDENTIFICATIONS FROM CARBON ADSORPTION EXTRACTS WATER YEAR 1962-3

Interval	Compound	Concentration* ug/l
4/19 - 4/29/63	Nitrile	
4/19 - 4/29/63	Amine	
5/2 - 6/3/63	Nitrile	
5/2 - 6/3/63	Amine	
6/17 - 7/1/63	Nitrile	
6/17 - 7/1/63	Amine	
7/17 - 7/24/63	Nitrile Amine	

*Concentration values, where shown, are calculated from quantitative gas chromatographic analysis of the aromatic fractions of CCE, and may be assigned the units of ug/l. In light of the unknown efficiency of carbon adsorption sampling for these compounds, the reported values represent minima, the actual values being equal to or greater than the reported values.
See page 21.

RADIOACTIVITY DETERMINATIONS

STATE: WEST VIRGINIA
MAJOR BASIN: OHIO RIVER
MINOR BASIN: KANAWHA RIVER
STATION LOCATION: KANAWHA RIVER AT WINFIELD DAM, WEST VIRGINIA 68

DATE SAMPLE TAKEN			RADIOACTIVITY IN WATER														RADIOACTIVITY IN PLANKTON					
			DATE OF DETERMINATION		ALPHA						BETA						DATE OF DETERMINATION		GROSS ACTIVITY			
					SUSPENDED		DISSOLVED		TOTAL		SUSPENDED		DISSOLVED		TOTAL				ALPHA		BETA	
MO.	DAY	YR.	MO.	DAY	pc/l	±	pc/l	±	pc/l	±	pc/l	±	pc/l	±	pc/l	±	MO.	DAY	pc/g	±	pc/g	±
10	6	62	11	2	-	-	-	-	-	-	5	6	5	8	10	10						
10	13	62	11	15	-	-	-	-	-	-	8	7	3	8	11	11						
10	19	62	11	9	-	-	-	-	-	-	9	5	8	7	17	9						
10	25	62	12	5	0	1	0	1	0	1	7	6	18	8	25	10						
11	21	62	12	22*	1	1	0	1	1	1	7	6	14	6	21	8						
12	14	62	1	24*	0	1	0	1	0	1	12	7	9	7	21	10						
1	10	63	2	26*	0	1	0	0	0	1	3	6	11	7	14	9						
2	8	63	3	28*	2	1	20	3	22	3	12	5	40	6	52	8						
3	22	63	4	16*	0	1	5	2	5	2	20	7	33	9	53	11						
4	26	63	5	24*	1	1	0	0	1	1	13	6	15	7	28	9						
5	18	63	6	24*	0	0	0	0	0	0	9	3	18	4	27	5						
6	17	63	7	30*	0	1	1	1	1	1	16	7	16	7	32	10						
7	31	63	8	21*	0	0	0	0	0	0	0	7	19	9	19	11						
8	15	63	10	10*	0	0	1	2	1	2	0	21	13	8	13	22						
9	30	63	11	20	0	0	0	1	0	1	8	5	22	7	30	9						

PLANKTON POPULATION

STATE WEST VIRGINIA
MAJOR BASIN OHIO RIVER
MINOR BASIN KANAWHA RIVER
STATION LOCATION KANAWHA RIVER AT WINFIELD DAM, WEST VIRGINIA 068

DATE OF SAMPLE			DOMINANT SPECIES OF DIATOMS AND PERCENT OF TOTAL DIATOMS (See text for Codes)									FUNGI AND SHEATHED BACTERIA (Number per ml.)	MICROINVERTEBRATES																					
			1ST		2ND		3RD		4TH				PROTOZOA (Identifiable) (Number per ml.)	ROTIFERS										CRUSTACEA								NEMATODES (Identifiable) (Number per liter)	OTHER ANIMAL FORMS (Number per liter)
														GENERA AND COUNT LEVEL (See text for Codes)										GENERA AND COUNT LEVEL (See text for Codes)									
														NUMBER PER LITER	1ST		2ND		3RD		4TH		5TH		NUMBER PER LITER	1ST		2ND		3RD			
MONTH	DAY	YEAR	SPECIES	PERCENT	SPECIES	PERCENT	SPECIES	PERCENT	SPECIES	PERCENT	OTHER SPECIES PERCENT				GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL		GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL		
10	19	62	27	37	2	13	26	11	28	6	33	0	0	0										0							0	0
11	2	62	27	45	92	12	89	11	58	7	25	20	0	15	11	1								0							1	0
11	21	62	2	10	92	8	62	8	47	7	67	0	0	0										0							0	0
11	30	62	56	16	92	9	82	8	2	8	59	0	0	0										0							0	0
12	14	62	62	17	47	11	28	11	92	4	57	60	0	0										0							0	0
1	7	63										0	0	0										0							0	0
1	21	63										0	0	0										0							0	0
2	15	63	2	19	93	10	31	5	51	4	62	0	0	0										0							0	0
3	1	63	92	68	12	7	71	5	87	5	15	-	-	0										0							0	0
3	14	63										-	-	0										0							0	0
4	1	63	2	19	31	13	92	13	70	10	45	-	-	0										0							0	0
4	18	63	27	49	82	46	26	3	46	1	1	-	-	0										0							0	0
5	6	63	82	36	26	18	56	15	58	12	19	-	-	4										0							0	0
5	18	63	82	76	67	8	91	4	92	4	8	-	-	-										-							-	-
6	3	63	82	66	26	13	56	5	25	3	13	-	-	2										0							0	0
6	17	63	27	87	26	5	91	3	56	2	3	-	-	20	15	2								0							1	0
7	1	63	27	36	82	29	26	8	70	7	20	-	-	0										0							0	0
7	16	63										-	-	-										-							-	-
8	5	63										-	-	21	2	3								0							0	0
8	15	63	26	73	58	16	23	3	70	3	5	-	-	189	20	4	7	4	17	3	22	3	2	3	44	50	4	76	2		0	0
8	29	63										-	-	-										-							-	-
9	30	63	92	20	26	15	70	14	23	11	40	-	-	0										1							0	0

PLANKTON POPULATION

STATE WEST VIRGINIA

MAJOR BASIN OHIO RIVER

MINOR BASIN KANAWHA RIVER

STATION LOCATION KANAWHA RIVER AT WINFIELD DAM, WEST VIRGINIA 68

DATE OF SAMPLE			ALGAE (Number per milliliter)								INERT DIATOM SHELLS		MOST ABUNDANT ALGAE - Genera and Count Level per ml. (See text for Codes)																			
			TOTAL	BLUE-GREEN		GREEN		FLAGELLATED (Pigmented)		DIATOMS			1ST		2ND		3RD		4TH		5TH		6TH		7TH		8TH		9TH		10TH	
MONTH	DAY	YEAR		COCCOID	FILAMENTOUS	COCCOID	FILAMENTOUS	GREEN	OTHER	CENTRIC	PENNATE	CENTRIC	PENNATE	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL
10	19	62	00	0	0	20	0	0	10	0	0	0	0																			
11	2	62	1200	20	70	90	0	70	0	840	110	290	110	68	3																	
11	21	62	500	0	0	0	0	0	0	120	330	0	0																			
11	30	62	500	0	0	0	0	40	0	0	460	40	0																			
12	14	62	600	0	60	0	0	0	40	120	410	40	40																			
1	7	63	100	0	0	0	0	20	30	20	20	0	60																			
1	21	63	00	0	0	0	0	0	0	0	0	30	0																			
2	15	63	100	0	0	0	0	0	0	0	70	0	60																			
3	1	63	100	0	10	0	0	0	70	0	0	0	80																			
3	14	63	200	0	0	0	0	0	0	0	180	0	400																			
4	1	63	00	0	0	0	0	0	0	0	0	0	50																			
4	18	63	900	0	0	20	0	350	0	480	20	20	0	68	1	71	1	51	1													
5	6	63	1000	0	0	220	0	40	0	510	240	350	20	71	2	68	1															
5	18	63	1600	70	40	350	0	460	0	530	150	150	20	71	2	51	2	26	1													
6	3	63	1700	0	0	190	0	0	0	1490	60	150	0	71	3	68	2															
6	17	63	2100	110	20	770	0	150	0	860	180	40	20	68	3	26	2	51	1													
7	1	63	1400	0	0	640	0	330	0	100	290	40	140	51	1	25	1															
7	16	63	1500	270	0	350	0	0	850	40	0	0	0	54	2	3	1	59	1	59	1											
8	5	63	4900	0	0	3170	0	200	1550	0	30	30	30	65	4	44	4	25	2	45	2	26	1	35	1	34	1					
8	15	63	8800	90	0	1740	0	240	2160	4290	240	90	0	68	5	38	2	69	1	25	1	29	1	54	1	88	1					
8	29	63	700	0	0	420	0	0	0	60	230	0	20	38	1																	
9	30	63	7700	0	20	7040	0	360	0	90	160	70	0	26	6	25	3	24	3	51	1											

ORGANIC CHEMICALS

RECOVERED BY CARBON FILTER TECHNIQUE

RESULTS IN MICROGRAMS PER LITER
(Parts per billion)

STATE WEST VIRGINIA

MAJOR BASIN OHIO RIVER

MINOR BASIN KANAWHA RIVER

STATION LOCATION KANAWHA RIVER AT WINFIELD DAM, WEST VIRGINIA 68

DATE OF SAMPLE					GALLONS FILTERED	EXTRACTABLES			CHLOROFORM EXTRACTABLES									
BEGINNING			END								NEUTRALS							
MONTH	DAY	YEAR	MONTH	DAY		TOTAL	CHLORO-FORM	ALCOHOL	ETHER INSOLUBLES	WATER SOLUBLES	TOTAL	ALIPHATICS	AROMATICS	OXYGEN-ATED COMPOUNDS	LOSS	WEAK ACIDS	STRONG ACIDS	BASES	LOSS
11	2	62	11	13	3140	594	394	200	8	67	217	9	22	161	25	28	16	12	46
12	14	62	12	30	3970	562	403	159	8	28	242	10	51	128	53	16	8	4	97
1	26	63	2	2	3030	667	505	162	5	30	308	22	49	160	77	20	10	5	127
2	8	63	2	15	3740	441	284	157	3	23	148	13	16	83	36	11	6	6	87
2	22	63	2	28	3880	401	295	106	9	36	124	10	20	72	22	18	9	9	90
3	22	63	4	1	3005	229	78	151	2	13	44	8	8	25	3	6	2	1	10
4	19	63	4	29	3690	872	738	134	37	96	288	12	29	207	40	37	30	37	213
5	20	63	6	3	8220	414	345	69	27	69	167	2	10	137	18	21	13	16	32
6	17	63	7	1	5240	602	486	116	57	122	187	5	12	158	12	26	20	26	48
7	17	63	7	24	4320	1543	1402	141	100	344	473	7	18	421	27	81	92	97	215

CHEMICAL, PHYSICAL AND BACTERIOLOGICAL ANALYSES

STATE WEST VIRGINIA

MAJOR BASIN OHIO RIVER

MINOR BASIN KANAWHA RIVER

STATION LOCATION KANAWHA RIVER AT WINFIELD DAM, WEST VIRGINIA 68

DATE OF SAMPLE			TEMP. (Degrees Centigrade)	DISSOLVED OXYGEN mg/l	pH	B.O.D. mg/l	C.O.D. mg/l	CHLORINE DEMAND		AMMONIA-NITROGEN mg/l	CHLORIDES mg/l	ALKALINITY mg/l	HARDNESS mg/l	COLOR (scale units)	TURBIDITY (scale units)	SULFATES mg/l	PHOSPHATES mg/l	TOTAL DISSOLVED SOLIDS mg/l	COLIFORMS per 100 ml.
MONTH	DAY	YEAR						1-HOUR mg/l	24-HOUR mg/l										
10	4	62	26.0	-	7.2	3.6	21	-	-	7.2	103	64	154	10	18	24	-	-	*33
10	18	62	19.0	-	7.0	8.2	43	-	-	4.8	35	44	66	10	9	48	-	-	8800
10	25	62	-	-	6.8	14.0	35	-	-	7.2	64	61	104	10	10	43	-	-	17000
11	1	62	-	.4	7.0	85.0	35	-	-	4.8	84	63	136	10	13	58	-	300	20000
11	8	62	14.5	3.0	7.0	7.6	53	-	-	1.2	45	45	102	5	18	19	-	197	7400
11	15	62	9.0	10.0	7.1	5.1	4	-	-	.4	14	29	46	25	25	-	-	83	10000
11	21	62	10.0	10.1	7.2	4.1	29	-	-	.4	16	24	46	20	9	-	-	125	120000
11	29	62	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	24000
11	30	62	8.0	10.7	7.5	5.2	-	-	-	.8	18	31	56	20	25	-	-	-	-
12	6	62	7.2	10.0	6.5	9.2	46	-	-	3.2	28	41	80	20	15	-	-	-	35000
12	14	62	3.0	11.7	6.9	-	27	-	-	2.0	25	37	68	10	16	-	-	124	-
12	18	62	3.0	12.2	7.2	-	24	-	-	3.6	39	36	80	10	10	5	-	170	-
12	19	62	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2000
12	27	62	5.0	12.3	7.0	6.9	24	-	-	1.6	26	27	64	20	52	-	-	94	3300
1	3	63	1.2	13.9	7.1	5.0	19	-	-	1.6	17	29	50	30	54	14	-	100	36000
1	10	63	4.0	12.9	7.0	5.8	11	-	-	2.0	23	32	64	10	16	14	-	120	7000
1	25	63	5.0	12.3	7.5	9.6	31	-	-	2.0	27	40	70	5	16	5	-	228	-
1	30	63	1.0	12.0	7.0	8.2	18	-	-	2.0	32	40	80	5	13	34	-	149	3000
2	7	63	2.0	13.0	6.6	7.8	36	-	-	2.4	15	21	46	25	15	-	-	89	6000
2	14	63	4.0	10.8	7.0	4.7	10	-	-	1.2	20	30	68	5	14	-	-	110	67000
2	21	63	4.0	11.6	7.0	4.8	12	-	-	2.0	22	29	42	10	40	-	-	198	35000
2	28	63	2.0	12.6	7.3	7.5	32	-	-	-	32	34	74	10	16	-	-	157	39000
3	7	63	5.0	9.8	6.5	3.4	84	-	-	.8	4	19	54	-	-	-	-	-	18000
3	13	63	6.5	10.9	6.8	5.3	162	-	-	.7	1	7	30	100	850	-	-	46	25000
3	21	63	5.0	10.6	6.8	2.8	56	-	-	.8	2	25	36	10	225	19	-	68	-
4	10	63	13.0	4.1	6.8	2.9	-	-	-	-	23	40	78	0	12	38	-	138	-
4	18	63	16.0	2.3	7.0	18.2	42	-	-	4.0	41	48	96	-	5	32	-	199	37000
4	25	63	-	1.0	7.0	11.0	30	-	-	2.8	39	47	82	20	17	38	-	-	320000
4	30	63	16.0	2.5	7.6	4.4	20	-	-	3.2	40	45	104	10	5	24	-	195	1000
5	8	63	18.0	3.8	6.8	5.4	37	-	-	3.6	33	49	86	10	5	44	-	174	-
5	9	63	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4100
5	15	63	20.0	-	6.8	11.5	36	-	-	3.8	41	55	94	10	15	43	-	-	-
6	6	63	23.0	5.5	6.7	2.3	17	-	-	3.0	16	49	58	10	20	39	-	190	1200
6	13	63	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4000
6	18	63	24.0	-	6.6	3.8	29	-	-	2.2	35	24	70	10	7	51	-	206	7300
7	11	63	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	100
7	12	63	27.0	.9	7.0	2.1	11	-	-	5.2	43	49	100	5	12	24	-	231	-
7	17	63	29.0	2.3	7.5	1.5	45	-	-	9.6	61	51	112	10	8	38	-	205	50

CHEMICAL, PHYSICAL AND BACTERIOLOGICAL ANALYSES

STATE WEST VIRGINIA
MAJOR BASIN OHIO RIVER
MINOR BASIN KANAWHA RIVER
STATION LOCATION KANAWHA RIVER AT WINFIELD DAM, WEST VIRGINIA 68

DATE OF SAMPLE			TEMP. (Degrees Centigrade)	DISSOLVED OXYGEN mg/l	pH	B.O.D. mg/l	C.O.D. mg/l	CHLORINE DEMAND		AMMONIA-NITROGEN mg/l	CHLORIDES mg/l	ALKALINITY mg/l	HARDNESS mg/l	COLOR (scale units)	TURBIDITY (scale units)	SULFATES mg/l	PHOSPHATES mg/l	TOTAL DISSOLVED SOLIDS mg/l	COLIFORMS per 100 ml.
MONTH	DAY	YEAR						1-HOUR mg/l	24-HOUR mg/l										
7	24	63	29.0	.0	7.4	6.4	44	-	-	14.0	67	69	110	10	13	-	-	187	82000
7	31	63	29.0	.6	7.5	13.7	26	-	-	6.0	41	49	100	5	9	-	-	186	1100
8	15	63	26.0	1.5	6.9	3.4	10	-	-	3.0	37	43	82	5	5	53	-	155	300
8	22	63	27.0	-	6.6	12.2	70	-	-	6.0	114	43	126	5	10	86	-	378	2800
8	29	63	28.0	-	6.8	14.2	84	-	-	14.0	75	71	130	30	15	120	-	276	1100
9	5	63	27.0	.0	6.8	12.8	71	-	-	15.0	110	66	174	15	17	125	-	435	6700
9	12	63	25.0	.0	6.8	15.6	77	-	-	18.0	121	95	156	20	6	115	-	277	2200
9	18	63	25.0	.0	6.8	1.3	40	-	-	9.0	112	76	152	25	10	-	-	336	-
9	19	63	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	300
9	25	63	24.0	.0	6.7	11.3	65	-	-	1.0	116	82	140	35	20	24	-	283	9000

STREAM FLOW DATA - 1962-1963

Thousand Cubic Feet per Second

PROVISIONAL--SUBJECT TO REVISION

Gaging Station at Charleston, West Virginia
Operated by U.S. Geological Survey

STATE: West Virginia

MAJOR BASIN: Ohio River

MINOR BASIN: Kanawha River

STATION LOCATION: Kanawha River at Winfield Dam, West Virginia

Day	October	November	December	January	February	March	April	May	June	July	August	September
1	3.780	8.280	9.640	32.600	8.480	13.500	14.300	9.290	11.500	5.670	5.780	2.270
2				19.900	12.600	22.800			10.600			
3				16.600	29.900	42.300			10.200			
4				15.400	28.500	37.900			10.700			
5				13.400	23.100	54.100			23.500			
6	8.210	9.050	29.300	10.700	19.800	90.500	8.590	5.540	21.700	3.620	7.300	2.440
7			24.800		18.600	93.100			17.300			
8			18.400		17.000	52.500			15.200			
9			16.000		17.100	29.700			14.300			
10			11.600		14.700	47.200			11.300			
11	4.100	58.600	8.270	13.300	14.700	66.400	7.470	5.110	7.600	2.530	2.560	2.570
12		54.900		33.700	16.700	131.000						
13		34.900		69.200	17.400	115.000						
14		23.100		64.000	16.700	67.800						
15		16.600		40.100	13.000	69.200						
16	3.250	11.300	10.600	25.700	10.600	74.200	6.510	13.400	4.040	3.070	2.190	2.220
17		10.800		21.000		99.500						
18		14.400		16.900		97.800						
19		24.300		15.300		86.600						
20		21.800		15.100		111.000						
21	3.050	19.900	31.000	16.700	19.200	72.900	7.040	9.820	3.920	5.610	2.830	1.810
22		40.200	38.500	16.300	18.400	38.000						
23		52.700	37.400	16.500	14.300	24.100						
24		36.400	32.200	14.500	11.300	34.900						
25		26.000	23.600	11.700	10.700	54.000						
26	3.770	18.100	19.700	8.780	10.700	72.700	7.120	8.450	3.760	3.640	2.380	1.680
27		16.300	19.200		11.000	69.400						
28		14.100	17.800		11.700	62.400						
29		10.000	20.600			57.700						
30		9.860	45.000			40.300						
31			47.100			21.500						

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LITTLE MIAMI RIVER AT CINCINNATI, OHIO

Samples are collected from State Highway 125 Bridge at Beechmont levee.

This station has a dual purpose. The first is to monitor the pollution of the Little Miami. In addition, the station is the site of the FWS Water Pollution Surveillance System's Little Miami Field Test Station for the evaluation of equipment and instrumentation.

This reach of the Little Miami River is affected by discharges of raw domestic sewage with quantities of floating solids in Clough Creek. The confluence of the two streams is downstream from the station but backwater from the Ohio occasionally forces some of the sewage upstream to the vicinity of the surveillance station. In general, high values of dissolved oxygen prevail but surges in flow have resulted in zero concentrations of dissolved oxygen as a result of resuspending deposited sludge.

The Little Miami River showed a relatively high phosphate content, averaging about 0.7 ppm from October 1962 to March 1963. The phosphate is believed to be from Clough Creek, which carries detergent wastes from a laundromat as well as raw sewage.

A high centric diatom count of nearly 49,000 per milliliter was obtained for the July 3 sample, indicating organic enrichment. Species of Stephanodiscus and Cyclotella accounted for nearly all of the diatoms.

An estimated 1,000 dead fish were observed on September 13 along approximately 500 feet of shoreline downstream from the Surveillance System field test station. This event is believed due to heavy rain beginning at 2 P.M. on September 12. Subsequently, the dissolved oxygen concentration dropped from 8 ppm at 4 P.M. to 0 ppm at 5 P.M. The raw water had a fetid odor during this period.

Bottom samples were collected on October 22, 1962 and July 1, 1963. Approximately 25 species of animals were collected from the riffles in October. Midge larvae dominated the fauna. The sewage fungus (Spaerotilus) covering many of the insects is indicative of pollution by domestic sewage.

Station Location:	Little Miami River at Cincinnati, Ohio
Major Basin:	Ohio River
Minor Basin:	Little Miami River
Station at:	39°07' Latitude 84°24' Longitude
Miles above mouth:	2
Activation Date:	October 4, 1960
Sampled by:	U.S. Public Health Service
Field Analysis by:	U.S. Public Health Service
Other Cooperating Agencies:	City of Cincinnati, Ohio Ohio Department of Health
Hydrologic Data:	
Nearest pertinent gaging station:	At Milford, Ohio
Gaging station operated by:	U.S. Geological Survey
Drainage area at gaging station:	1,195 square miles
Period of record:	1915-17; 1925-36; 1938-present
Average discharge in record period:	1,205 cfs.
Maximum discharge in record period:	84,100 cfs.
Minimum discharge in record period:	27 cfs.
Remarks:	

ALKYL BENZENE SULFONATE (ABS)

Date	mg/l
3-13-63	0.07
3-20-63	0.04
4- 2-63	0.12
4-10-63	0.12
4-17-63	0.16
4-22-63	0.07
5- 1-63	0.06
5- 8-63	0.06
5-15-63	0.07
5-22-63	0.11
5-29-63	0.21

ELEMENTAL ANALYSES

		Composite Interval 10/1/62 to 12/31/62	Composite Interval 4/1/63 to 6/30/63
Analysis by wet or flame methods. Results in mg/l	F	.28	.25
	Na	14	11
	K	3.6	2.3
Analysis by Spectrographic methods. Results in micrograms per liter	Zn	9	3
	Cd	*4	*3
	As	*37	*32
	B	30	45
	P	82	32
	Fe	223	10
	Mo	47	60
	Mn	1.3	*1.7
	Al	—	*16
	Be	*.09	*.08
	Cu	3	3
	Ag	*.7	*.8
	Ni	*2	*3
	Co	*7	*3
	Pb	19	*8
	Cr	*2	*8
	V	*4	*16
	Ba	58	33
	Sr	141	245

*Actual value is less than the amount shown. Reported result indicates limit of sensitivity at which test was performed. See text for explanation.

STRONTIUM 90 ACTIVITY

Composite Interval	pc/l	±	Composite Interval	pc/l	±
October to December	1.6	.3	April to June	—	—
January to March	—	—	July to September	5.3	.5

± at 95% Confidence Limits

SPECIFIC QUALITATIVE IDENTIFICATIONS FROM CARBON ADSORPTION EXTRACTS WATER YEAR 1962-3

Interval	Compound	Concentration* ug/l

*Concentration values, where shown, are calculated from quantitative gas chromatographic analysis of the aromatic fractions of CCE, and may be assigned the units of ug/l. In light of the unknown efficiency of carbon adsorption sampling for these compounds, the reported values represent minima, the actual values being equal to or greater than the reported values.

See page 21.

RADIOACTIVITY DETERMINATIONS

STATE OHIO

MAJOR BASIN OHIO RIVER

MINOR BASIN LITTLE MIAMI RIVER

STATION LOCATION LITTLE MIAMI RIVER AT CINCINNATI, OHIO 90

DATE SAMPLE TAKEN			RADIOACTIVITY IN WATER												RADIOACTIVITY IN PLANKTON					
			DATE OF DETERMINATION		ALPHA						BETA							GROSS ACTIVITY		
					SUSPENDED		DISSOLVED		TOTAL		SUSPENDED		DISSOLVED		TOTAL			ALPHA		BETA	
MO.	DAY	YR.	MO.	DAY	pc/l	±	pc/l	±	pc/l	±	pc/l	±	pc/l	±	pc/l	±		MO. DAY	pc/g	±	pc/g	±
10	3	62	10	25	-	-	-	-	-	-	26	8	25	9	51	12						
10	10	62	11	1	-	-	-	-	-	-	9	7	28	9	37	11						
10	17	62	11	2	-	-	-	-	-	-	10	12	25	14	35	18						
10	24	62	11	8	0	1	2	2	2	2	13	11	58	16	71	19						
10	31	62	11	16	-	-	-	-	-	-	13	11	19	14	32	18						
11	28	62	12	28*	0	1	1	1	1	1	14	7	38	10	52	12						
12	26	62	1	2*	0	1	1	1	1	1	11	13	46	17	57	21						
1	30	63	2	20*	1	4	1	2	2	4	30	17	74	21	154	27						
2	27	63	3	20*	0	0	0	0	0	0	33	6	70	10	103	12						
3	27	63	4	5*	12	6	0	1	12	6	363	38	85	9	448	39						
4	24	63	6	7*	1	2	0	1	1	2	206	21	60	15	266	26						
5	29	63	6	7*	1	1	0	1	1	1	54	14	70	10	124	17						
6	26	63	7	3*	0	1	0	2	0	2	18	12	40	16	58	20						
7	31	63	8	21*	1	1	1	2	2	2	0	26	42	15	42	30						
8	28	63	10	4*	1	1	0	1	1	1	77	9	67	10	144	13						
9	23	63	10	6*	2	2	2	2	4	3	16	13	13	15	29	20						

PLANKTON POPULATION

STATE OHIO

MAJOR BASIN OHIO RIVER

MINOR BASIN LITTLE MIAMI RIVER

STATION LOCATION LITTLE MIAMI RIVER AT CINCINNATI, OHIO 090

Date of Sample: Month	Day	Year	Dominant Species of Diatoms and Percent of Total Diatoms (See text for Codes): 1st Species	1st Percent	2nd Species	2nd Percent	3rd Species	3rd Percent	4th Species	4th Percent	Other Species Percent	Fungi and Sheathed Bacteria (Number per ml.)	Microinvertebrates: Protozoa (Identifiable) Number per ml.	Rotifers: Number per Liter	Rotifers Genera and Count Level (See text for Codes): 1st Genus	1st Count Level	2nd Genus	2nd Count Level	3rd Genus	3rd Count Level	4th Genus	4th Count Level	5th Genus	5th Count Level	Crustacea: Number per Liter	Crustacea Genera and Count Level (See text for Codes): 1st Genus	1st Count Level	2nd Genus	2nd Count Level	3rd Genus	3rd Count Level	Nematodes (Identifiable) Number per liter	Other Animal Forms (Number per liter)
10	3	62	82	27	26	18	23	18	92	7	30	-	-	4											0							5	0
10	24	62	82	32	97	22	57	18	26	11	17	-	-	3											0							0	0
11	21	62	36	42	92	11	64	11	65	8	28	-	-	0											0							0	0
12	5	62	92	46	36	46	65	3	32	1	4	140	-	1											0							0	0
12	19	62	92	27	36	18	91	15	57	5	35	80	-	7	17	1									2							0	0
1	9	63	92	27	91	21	51	11	36	9	32	-	-	3											0							1	0
1	23	63	92	11	51	11	36	10	82	8	60	-	-	0											1							0	0
2	8	63	92	15	36	14	71	10	51	9	52	-	-	0											0							0	0
2	28	63	91	57	92	12	36	5	86	4	22	-	-	0											0							0	0
3	6	63	71	16	92	14	36	10	65	8	52	-	-	0											0							0	0
3	20	63										-	-	1											0							7	0
4	3	63	86	20	92	19	52	10	36	8	43	-	-	0											0							0	0
4	17	63	92	34	82	31	71	5	72	4	26	-	-	0											0							0	0
5	8	63	82	80	67	6	92	4	64	2	8	-	-	-											-							-	-
5	22	63	27	73	71	6	92	5	70	3	13	-	-	-											-							-	-
6	5	63	82	58	71	4	70	3	51	2	33	-	-	-											-							-	-
6	19	63	27	46	26	23	23	5	71	3	23	-	-	-											-							-	-
7	3	63	82	67	23	23	26	3	64	3	4	-	-	-											-							-	-
7	18	63	26	34	82	31	27	29			6	-	-	-											-							-	-
7	31	63	23	73	26	16	27	7	82	3	1	-	-	-											-							-	-
8	21	63	26	63	23	13	27	9	82	8	7	-	-	-											-							-	-
9	18	63	26	39	98	33	82	10	23	8	10	-	-	-											-							-	-

PLANKTON POPULATION

STATE OHIO

MAJOR BASIN OHIO RIVER

MINOR BASIN LITTLE MIAMI RIVER

STATION LOCATION LITTLE MIAMI RIVER AT CINCINNATI, OHIO 90

DATE OF SAMPLE			ALGAE (Number per milliliter)									INERT DIATOM SHELLS		MOST ABUNDANT ALGAE - Genera and Count Level per ml. (See text for Codes)																	
			TOTAL	BLUE-GREEN		GREEN		FLAGELLATED (Pigmented)		DIATOMS				1ST		2ND		3RD		4TH		5TH		6TH		7TH		8TH		9TH		10TH	
MONTH	DAY	YEAR		COCCOID	FILAMENTOUS	COCCOID	FILAMENTOUS	GREEN	OTHER	CENTRIC	PENNATE	CENTRIC	PENNATE	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL
10	3	62	39000	0	0	580	170	1410	410	34780	1620	6000	210	68	8	71	7	51	4	69	3	60	2	87	2	92	2	82	1	38	1	88	1
10	24	62	76800	0	0	6210	*	110	0	33530	520	1280	250	50	8	69	7	71	7	68	6	26	5	27	5	87	1						
11	21	62	200	0	0	0	0	0	0	0	230	90	230																				
12	5	62	1300	0	0	0	0	90	20	90	1060	20	160	92	2	82	2																
12	19	62	400	0	0	20	0	90	0	150	110	20	20																				
1	9	63	300	0	0	0	0	0	0	0	260	0	50																				
1	23	63	200	0	0	0	0	20	0	20	120	0	20																				
2	8	63	300	0	0	0	0	20	0	0	260	0	110																				
2	28	63	500	0	0	0	0	0	40	0	420	0	180	92	1																		
3	6	63	500	0	20	0	0	20	20	0	400	40	760																				
3	20	63	200	0	0	0	0	20	20	20	140	0	20																				
4	3	63	800	0	0	0	0	130	380	190	80	0	130	65	2																		
4	17	63	27000	0	0	130	0	1010	1850	20240	3820	840	250	71	9	68	5	92	4	63	4	51	3	88	3	91	1	62	1	87	1		
5	8	63	20900	20	0	310	0	2200	20	15090	3300	400	530	71	7	51	4	88	4	92	3	87	3	52	1								
5	22	63	15200	40	130	220	0	420	0	13160	1190	260	880	68	7	68	2	51	1	87	1	92	1	69	1	91	1	52	1				
6	5	63	15200	20	460	1630	0	400	270	11570	690	1260	340	69	6	71	6	24	2	26	2	17	2	88	2	51	2	63	2	25	1		
6	19	63	51700	80	480	7640	0	900	170	39520	2940	1930	320	71	8	69	7	24	5	88	3	38	3	26	3	51	3	17	2	85	2	92	1
7	3	63	52900	20	0	1970	0	40	0	48870	2030	5180	580	71	8	68	7	25	4	38	2	87	2	24	2	30	1						
7	18	63	25100	70	0	13950	0	70	70	9680	1300	2300	110	68	6	71	5	25	4	38	3	26	3	35	1	88	1						
7	31	63	47900	20	0	10410	0	400	40	33410	3520	6070	2750	68	8	38	5	34	5	25	5	69	4	24	4	71	3	51	1				
8	21	63	10000	50	0	1800	0	70	0	7500	570	6250	620	66	6	38	3	71	3	88	2	35	1										
9	18	63	86800	20	0	1340	0	110	0	84070	1230	16950	470	69	9	68	7	71	5	38	3	25	2										
10	24	62				*	36450																										

ORGANIC CHEMICALS

RECOVERED BY CARBON FILTER TECHNIQUE

RESULTS IN MICROGRAMS PER LITER
(Parts per billion)

STATE OHIO

MAJOR BASIN OHIO RIVER

MINOR BASIN LITTLE MIAMI RIVER

STATION LOCATION LITTLE MIAMI RIVER AT CINCINNATI, OHIO 90

DATE OF SAMPLE BEGINNING			DATE OF SAMPLE END		GALLONS FILTERED	EXTRACTABLES			CHLOROFORM EXTRACTABLES									
											NEUTRALS							
MONTH	DAY	YEAR	MONTH	DAY		TOTAL	CHLORO-FORM	ALCOHOL	ETHER INSOLUBLES	WATER SOLUBLES	TOTAL	ALIPHATICS	AROMATICS	OXYGEN-ATED COMPOUNDS	LOSS	WEAK ACIDS	STRONG ACIDS	BASES	LOSS
8	7	63	8	14	4800	229	98	131	2	15	52	10	8	32	2	15	6	2	6
9	4	63	9	11	4563	168	56	112	1	11	26	4	4	17	1	9	3	1	5

CHEMICAL, PHYSICAL AND BACTERIOLOGICAL ANALYSES

STATE OHIO

MAJOR BASIN OHIO RIVER

MINOR BASIN LITTLE MIAMI RIVER

STATION LOCATION LITTLE MIAMI RIVER AT CINCINNATI, OHIO

DATE OF SAMPLE			TEMP. (Degrees Centigrade)	DISSOLVED OXYGEN mg/l	pH	B.O.D. mg/l	C.O.D. mg/l	CHLORINE DEMAND		AMMONIA-NITROGEN mg/l	CHLORIDES mg/l	ALKALINITY mg/l	HARDNESS mg/l	COLOR (scale units)	TURBIDITY (scale units)	SULFATES mg/l	PHOSPHATES mg/l	TOTAL DISSOLVED SOLIDS mg/l	COLIFORMS per 100 ml.
MONTH	DAY	YEAR						1-HOUR mg/l	24-HOUR mg/l										
10	3	62	17.1	7.7	8.3	6.7	19	4.3	11.6	.7	24	216	60	5	80	35	1.1	337	150000
10	10	62	17.9	8.3	7.9	2.3	18	1.3	4.3	.5	17	204	264	10	90	25	1.0	302	9000
10	17	62	19.3	9.6	8.4	5.0	24	3.1	11.1	.4	24	228	284	15	88	40	.9	310	230000
10	24	62	11.6	9.3	8.3	1.9	30	4.3	6.4	.1	29	260	308	10	47	55	.1	420	640000
10	31	62	9.8	9.1	8.1	2.5	14	2.8	6.5	.5	24	240	288	5	35	50	1.2	365	-
11	14	62	7.6	10.2	7.9	2.6	19	4.5	8.4	.7	14	168	220	25	45	40	.6	281	-
11	21	62	7.8	11.0	8.1	1.8	-	3.8	-	.7	13	170	245	20	*25	55	.4	316	8300
11	28	62	-	12.6	8.4	1.3	13	2.8	4.9	.3	15	236	312	0	*25	50	.6	365	48000
12	5	62	6.0	12.6	8.5	1.2	10	1.0	3.1	.2	15	246	320	5	*25	45	1.0	370	13000
12	12	62	.2	-	8.5	2.5	11	2.4	4.5	.2	16	238	292	5	*25	45	1.0	355	6400
12	19	62	3.0	15.0	8.4	1.4	15	2.4	3.8	.0	20	230	280	0	*25	35	1.0	350	20000
12	26	62	.4	13.6	8.4	3.7	14	2.1	4.5	.3	24	204	272	5	*25	45	.7	335	16000
1	2	63	.2	14.5	8.0	6.8	28	5.7	11.3	.7	22	166	220	-	*25	50	.6	300	380000
1	9	63	1.5	13.6	8.1	5.0	11	2.6	8.5	.4	23	224	284	-	*25	50	.9	362	500
1	16	63	.0	13.6	8.2	4.5	24	2.3	11.3	.4	17	170	252	-	130	55	.4	310	11000
1	23	63	-	14.1	8.1	3.5	12	4.5	7.3	.6	16	244	308	-	*25	64	.7	365	6000
1	30	63	.6	12.7	8.2	3.8	-	1.1	8.7	.9	23	288	348	-	*25	70	1.2	455	300
2	6	63	2.0	12.6	7.9	8.4	18	1.7	15.4	1.1	25	120	132	20	*25	35	.6	220	6400
2	13	63	1.0	12.5	7.9	3.4	16	6.6	13.0	.5	17	148	204	20	*25	40	.4	-	*40
2	20	63	1.0	12.3	8.1	2.5	16	4.5	8.0	.6	21	216	276	5	*25	40	.6	320	2000
2	27	63	.2	14.3	8.0	3.8	21	2.4	10.8	.6	25	212	272	10	*25	40	1.0	350	200
3	6	63	2.8	11.4	8.1	8.3	-	-	-	.8	4	76	110	10	1000	10	.2	123	8700
3	13	63	6.8	11.3	8.0	4.7	-	2.8	7.6	.5	12	110	160	15	*25	33	.2	210	760
3	19	63	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	*200
3	20	63	8.8	10.6	7.3	5.5	26	5.2	13.6	.6	6	80	108	20	380	27	.1	140	-
3	27	63	10.2	9.8	7.5	1.6	14	4.2	-	.6	11	200	260	5	*25	52	.2	300	22000
4	3	63	16.2	8.2	7.5	3.2	-	4.9	11.2	.5	15	192	240	5	*25	55	.0	300	100000
4	10	63	12.0	10.3	8.4	2.8	21	3.9	8.7	.2	16	230	280	5	75	57	.6	350	500
4	17	63	13.8	12.4	7.5	5.6	-	2.8	8.7	.1	20	240	290	0	*25	60	.2	350	14000
4	24	63	10.7	9.8	7.2	-	-	4.9	13.6	.4	11	124	152	20	650	36	.0	197	180000
5	1	63	11.9	9.4	7.2	1.7	19	3.4	9.2	.5	14	196	240	10	*25	53	.2	280	3800
5	8	63	19.8	13.4	7.5	5.7	-	3.1	9.4	.2	22	230	284	5	*25	53	.2	350	100
5	15	63	18.7	8.4	7.6	4.7	-	7.3	15.6	.3	12	164	210	10	*25	47	.6	250	-
5	22	63	18.3	10.9	7.1	4.1	-	4.5	11.4	.3	11	192	250	15	*25	50	.5	320	-
5	29	63	20.1	10.1	7.9	5.3	-	4.5	-	.2	17	220	280	5	*25	52	.7	350	6600
6	4	63	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	100000
6	5	63	21.2	8.1	7.8	3.8	-	4.4	11.0	.3	20	240	290	5	*25	50	.4	350	-
6	12	63	22.1	9.4	7.8	4.4	-	4.7	13.3	.4	11	198	250	5	*25	46	.5	310	8000

CHEMICAL, PHYSICAL AND BACTERIOLOGICAL ANALYSES

STATE OHIO
MAJOR BASIN OHIO RIVER
MINOR BASIN LITTLE MIAMI RIVER
STATION LOCATION LITTLE MIAMI RIVER AT CINCINNATI, OHIO 90

DATE OF SAMPLE			TEMP. (Degrees Centigrade)	DISSOLVED OXYGEN mg/l	pH	B.O.D. mg/l	C.O.D. mg/l	CHLORINE DEMAND		AMMONIA-NITROGEN mg/l	CHLORIDES mg/l	ALKALINITY mg/l	HARDNESS mg/l	COLOR (scale units)	TURBIDITY (scale units)	SULFATES mg/l	PHOSPHATES mg/l	TOTAL DISSOLVED SOLIDS mg/l	COLIFORMS per 100 ml.
MONTH	DAY	YEAR						1-HOUR mg/l	24-HOUR mg/l										
6	19	63	23.1	9.5	7.2	5.8	-	4.7	13.6	.4	26	20	248	10	*25	50	.2	320	7200
6	26	63	24.8	9.6	7.7	5.1	-	4.9	15.4	.4	23	210	280	5	*25	50	.4	330	10
7	3	63	25.6	8.5	7.4	7.5	-	5.2	-	.4	22	188	290	5	*25	49	.2	320	1800
7	10	63	23.0	9.3	7.4	6.5	-	5.1	15.6	.1	32	240	300	5	*25	62	.1	390	600
7	18	63	27.0	9.8	8.4	7.0	-	5.2	16.0	.4	26	188	240	0	*25	53	.2	310	1500
7	24	63	24.9	7.7	8.3	6.5	-	3.6	11.3	.3	25	190	260	5	*25	47	.5	310	2400
7	29	63	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
7	31	63	26.4	9.1	7.9	6.8	-	5.6	15.4	.1	25	198	310	5	*25	47	.3	320	-
8	7	63	25.0	.0	7.2	*7.0	-	-	-	.0	40	160	220	15	80	43	1.1	300	-
8	14	63	24.8	8.4	8.1	5.4	-	4.3	12.0	.3	30	240	280	5	*25	46	.5	320	6100
8	21	63	21.2	6.1	8.0	3.5	-	5.1	12.6	.1	40	180	250	0	*25	44	.7	368	1900
8	28	63	22.2	7.1	7.4	2.8	-	2.9	12.8	-	23	194	270	5	*25	49	.8	320	50000
9	4	63	22.6	9.4	7.4	4.7	-	2.5	11.2	.2	28	216	270	5	*25	50	.4	340	300
9	11	63	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3300
9	18	63	21.8	11.5	8.1	6.5	-	2.0	11.3	.2	35	240	290	5	*25	55	.3	350	-
9	25	63	17.4	10.5	7.7	7.1	-	1.3	9.0	.0	34	232	300	5	*25	55	.3	340	-

STREAM FLOW DATA - 1962-1963

Thousand Cubic Feet per Second

PROVISIONAL--SUBJECT TO REVISION

Gaging Station at Milford, Ohio
Operated by U.S. Geological Survey

STATE Ohio

MAJOR BASIN Ohio River

MINOR BASIN Little Miami River

STATION LOCATION Little Miami River at Cincinnati, Ohio

Day	October	November	December	January	February	March	April	May	June	July	August	September
1	.100	.185	.335	.515	.300	3.190	2.890	1.330	.312	.119	.107	.131
2	.124	.173	.322	.434	.800	4.250	1.870	1.030	.304	.152	.102	.119
3	.245	.169	.304	.407	1.910	3.310	1.400	.892	.290	.184	.099	.110
4	.371	.165	.308	.380	1.160	17.600	1.150	.792	.272	.149	.099	.107
5	.304	.173	.366	.366	.879	53.700	1.010	.708	.268	.137	.091	.102
6	.225	.173	.366	.350	1.050	32.200	.892	.654	.335	.131	.077	.099
7	.229	.197	.371	.340	1.700	8.100	.828	.600	.828	.131	.077	.099
8	.304	.189	.362	.330	1.330	3.670	.780	.545	.452	.116	.093	.091
9	.281	.193	.348	.330	.786	2.950	.726	.446	.312	.110	.125	.086
10	.241	1.520	.330	.475	.702	3.540	.684	.484	.290	.104	.213	.081
11	.205	1.990	.294	5.340	.970	3.110	.618	.452	.272	.096	.217	.077
12	.181	1.040	.263	3.890	.816	3.440	.578	.534	.258	.093	.191	.081
13	.169	.712	.229	1.880	.578	2.940	.562	1.060	.250	.096	.268	.096
14	.169	.560	.210	.816	.496	2.340	.545	.924	.233	.137	.400	.093
15	.177	.475	.335	.690	.440	1.760	.518	.714	.217	.131	.281	.088
16	.165	.438	.322	.690	.400	6.660	.479	.584	.209	.180	.209	.086
17	.205	.620	.326	.618	.350	16.400	.474	.550	.198	.146	.167	.083
18	.193	1.010	.335	.618	.390	5.730	.490	.696	.184	.125	.134	.081
19	.185	1.170	.344	.556	.512	11.000	.624	.572	.167	.113	.221	.077
20	.173	.846	.366	.556	.720	10.800	3.110	.534	.177	.177	.299	.073
21	.162	.700	.430	.435	.666	5.100	2.140	.578	.225	.299	.550	.069
22	.151	.610	.470	.450	.435	3.030	3.250	.490	.250	.286	.523	.067
23	.148	.535	.470	.430	.380	2.290	6.520	.425	.184	.286	.375	.064
24	.137	.456	.362	.400	.340	1.890	4.160	.425	.180	.263	.286	.063
25	.137	.420	.348	.370	.330	1.690	2.480	.395	.167	.213	.233	.062
26	.144	.389	.340	.350	.365	1.660	1.800	.375	.149	.164	.236	.063
27	.148	.366	.281	.330	.317	2.350	1.390	.360	.149	.140	.322	.062
28	.169	.358	.258	.320	.312	1.890	1.130	.380	.134	.128	.233	.063
29	.225	.348	.448	.310		1.460	1.070	.385	.128	.137	.209	.064
30	.225	.340	.979	.310		1.290	1.630	.360	.125	.137	.167	.064
31	.213		.665	.300		2.330		.340		.119	.149	

MONONGAHELA RIVER AT PITTSBURGH, PENNSYLVANIA

Samples are collected from the Hayes Mine Filter Plant intake located at the mouth of the Monongahela River.

This river is navigable for its entire length and receives large quantities of industrial wastes in its lower reaches. The chief products are steel, coal, glass and clay items and fabricated steel items. This is generally an acid stream because of acid mine wastes from its major tributary, the Youghiogheny. The Monongahela and Youghiogheny Rivers are interstate streams involving Maryland, West Virginia, and Pennsylvania.

Bottom samples were collected on May 9, 1963. The water was oily and the bottom covered with oil and tar-like deposits so that benthic animals have been essentially eliminated on both the bottom and the attached plants.

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Station Location:	Monongahela River at Pittsburgh, Pennsylvania
Major Basin:	Ohio River
Minor Basin:	Monongahela River
Station at:	40°25' Latitude 79°57' Longitude
Miles above mouth:	4
Activation Date:	June 13, 1961
Sampled by:	South Pittsburgh Water Company
Field Analysis by:	South Pittsburgh Water Company U.S. Public Health Service
Other Cooperating Agencies:	Pennsylvania State Department of Health
Hydrologic Data:	
Nearest pertinent gaging station:	At Braddock, Pennsylvania
Gaging station operated by:	U.S. Geological Survey
Drainage area at gaging station:	7,337 square miles
Period of record:	1938 to present
Average discharge in record period:	12,470 cfs.
Maximum discharge in record period:	201,000 cfs.
Minimum discharge in record period:	559 cfs.

Remarks: Flows regulated by operations of locks, dams, and hydroelectric plants. Discharge figures corrected for diversions to Kiskiminetas basin.

ALKYL BENZENE SULFONATE (ABS)

Date	mg/l

ELEMENTAL ANALYSES

		Composite Interval 10/1/62 to 12/31/62	Composite Interval 4/1/63 to 6/30/63
Analysis by wet or flame methods. Results in mg/l	F	.15	.40
	Na	23	20
	K	2.4	2.3
Analysis by Spectrographic methods. Results in micrograms per liter	Zn	185	358
	Cd	*3	7
	As	86	*50
	B	65	72
	P	393	400
	Fe	105	14
	Mo	*50	*50
	Mn	455	715
	Al	–	1430
	Be	.31	.80
	Cu	74	157
	Ag	*.5	*.7
	Ni	26	86
	Co	*5	16
	Pb	*6	*7
	Cr	*1	*7
	V	*3	*14
	Ba	8	43
	Sr	154	130

*Actual value is less than the amount shown. Reported result indicates limit of sensitivity at which test was performed. See text for explanation.

STRONTIUM 90 ACTIVITY

Composite Interval	pc/l	±	Composite Interval	pc/l	±
October to December	1.5	.3	April to June	2.7	.3
January to March	–	–	July to September	3.3	.6

± at 95% Confidence Limits

SPECIFIC QUALITATIVE IDENTIFICATIONS FROM CARBON ADSORPTION EXTRACTS WATER YEAR 1962-3

Interval	Compound	Concentration* ug/l

*Concentration values, where shown, are calculated from quantitative gas chromatographic analysis of the aromatic fractions of CCE, and may be assigned the units of ug/l. In light of the unknown efficiency of carbon adsorption sampling for these compounds, the reported values represent minima, the actual values being equal to or greater than the reported values.

See page 21.

RADIOACTIVITY DETERMINATIONS

STATE PENNSYLVANIA

MAJOR BASIN OHIO RIVER

MINOR BASIN MONONGAHELA RIVER

STATION LOCATION MONONGAHELA RIVER AT PITTSBURGH, PENNSYLVANIA 83

DATE SAMPLE TAKEN			RADIOACTIVITY IN WATER												RADIOACTIVITY IN PLANKTON				
			DATE OF DETERMINATION	ALPHA				BETA							GROSS ACTIVITY				
				SUSPENDED		DISSOLVED		TOTAL		SUSPENDED		DISSOLVED		TOTAL		DATE OF DETERMINATION	ALPHA		BETA	
MO.	DAY	YR.	MO. DAY	pc/l	±	pc/l	±	pc/l	±	pc/l	±	pc/l	±	pc/l	±	MO. DAY	pc/g	±	pc/g	±
10	2	62	10 25	-	-	-	-	-	-	6	10	26	15	32	18					
10	9	62	12 17	-	-	-	-	-	-	13	8	35	13	48	15					
10	16	62	12 3	0	1	0	1	0	1	7	6	18	6	25	8					
10	23	62	11 21	-	-	-	-	-	-	3	6	31	10	34	12					
10	30	62	12 19	-	-	-	-	-	-	1	6	25	9	26	11					
11	27	62	12 15*	0	0	1	1	1	1	3	5	22	6	25	8					
12	27	62	1 21*	0	0	0	0	0	0	2	3	11	4	13	4					
1	29	63	2 20*	0	1	0	1	0	1	2	6	13	8	15	10					
2	26	63	3 20*	0	0	0	1	0	1	13	6	25	8	38	10					
3	26	63	4 17*	4	4	1	1	5	4	96	39	11	8	107	40					
4	30	63	5 24*	0	0	1	1	1	1	0	19	29	9	29	21					
5	29	63	6 21*	1	3	1	2	1	4	0	12	49	11	49	16					
6	25	63	7 31*	0	0	0	0	0	0	5	5	24	7	29	9					
7	30	63	8 23*	0	1	0	1	0	1	3	6	35	9	38	11					
8	27	63	10 4*	0	0	0	1	0	1	1	5	44	16	45	17					
9	23	63	11 6*	0	1	0	2	0	2	0	23	20	9	20	25					

PLANKTON POPULATION

STATE PENNSYLVANIA

MAJOR BASIN OHIO RIVER

MINOR BASIN MONONGAHELA RIVER

STATION LOCATION MONONGAHELA RIVER AT PITTSBURGH, PENNSYLVANIA 083

DATE OF SAMPLE			DOMINANT SPECIES OF DIATOMS AND PERCENT OF TOTAL DIATOMS (See text for Codes)									FUNGI AND SHEATHED BACTERIA Number per ml.	PROTOZOA (Identifiable) Number per ml.	MICROINVERTEBRATES: ROTIFERS											MICROINVERTEBRATES: CRUSTACEA							NEMATODES (Identifiable) Number per liter	OTHER ANIMAL FORMS (Number per liter)
			1ST		2ND		3RD		4TH						GENERA AND COUNT LEVEL (See text for Codes): 1ST		2ND		3RD		4TH		5TH			GENERA AND COUNT LEVEL (See text for Codes): 1ST		2ND		3RD			
MONTH	DAY	YEAR	SPECIES	PERCENT	SPECIES	PERCENT	SPECIES	PERCENT	SPECIES	PERCENT	OTHER SPECIES PERCENT			NUMBER PER LITER	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	NUMBER PER LITER	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL		
10	2	62	43	15	71	13	64	10	74	10	52	-	-	-											-							-	-
10	16	62	43	13	16	7	71	6	23	5	69	-	-	72	2	4									0							0	0
11	7	62	43	18	92	9	71	7	64	5	61	-	-	0											0							0	0
11	20	62										-	-	0											0							0	0
12	4	62										-	-	1											0							0	0
12	18	62										-	-	0											0							0	0
1	8	63										-	-	0											0							0	0
1	22	63										-	-	0											0							0	0
2	5	63	74	12	70	9	65	8	2	7	64	-	-	-											-							-	-
2	19	63										-	-	0											0							0	0
3	5	63										-	-	-											-							-	-
3	19	63										-	-	0											0							0	0
4	2	63										-	-	0											0							0	0
4	16	63										-	-	0											0							0	0
5	7	63										-	-	-											-							-	-
5	21	63										-	-	-											-							-	-
6	11	63										-	-	-											-							-	-
6	18	63										-	-	-											-							-	-
8	5	63										-	-	-											-							-	-
8	20	63										-	-	-											-							-	-
9	4	63										-	-	-											-							-	-
9	16	63										-	-	-											-							-	-

PLANKTON POPULATION

STATE PENNSYLVANIA

MAJOR BASIN OHIO RIVER

MINOR BASIN MONONGAHELA RIVER

STATION LOCATION MONONGAHELA RIVER AT PITTSBURGH, PENNSYLVANIA 83

DATE OF SAMPLE			ALGAE (Number per milliliter)									INERT DIATOM SHELLS		MOST ABUNDANT ALGAE - Genera and Count Level per ml. (See text for Codes)																	
			TOTAL	BLUE-GREEN		GREEN		FLAGELLATED (Pigmented)		DIATOMS				1ST		2ND		3RD		4TH		5TH		6TH		7TH		8TH		9TH		10TH	
MONTH	DAY	YEAR		COCCOID	FILAMENTOUS	COCCOID	FILAMENTOUS	GREEN	OTHER	CENTRIC	PENNATE	CENTRIC	PENNATE	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL
10	2	62	4200	0	0	3850	0	170	0	40	120	0	0	28	5	51	1																
10	16	62	7900	0	0	7910	0	0	0	40	0	0	0	28	6	25	1																
11	7	62	3100	0	0	60	0	3020	0	0	40	0	0	51	5																		
11	20	62	2100	0	40	80	0	0	0	750	1200	290	210																				
12	4	62	00	0	0	0	0	0	0	0	20	0	30																				
12	18	62	00	0	0	0	0	0	0	0	0	0	0																				
1	8	63	00	0	0	0	0	0	0	0	0	0	20																				
1	22	63	00	0	0	0	0	0	0	0	0	0	0																				
2	5	63	100	0	0	0	0	0	0	20	90	0	460																				
2	19	63	100	0	0	0	0	0	0	60	10	10	40																				
3	5	63	300	0	0	20	0	0	0	20	220	0	590																				
3	19	63	00	0	0	0	0	0	0	0	20	20	30																				
4	2	63	00	0	0	0	0	0	0	0	40	10	40																				
4	16	63	4600	0	0	0	0	4580	0	0	0	0	0	51	5																		
5	7	63	00	0	0	0	0	0	0	0	0	0	0																				
5	21	63	00	0	0	0	0	0	0	0	0	0	0																				
6	11	63	100	0	0	0	0	0	0	0	60	0	10																				
6	18	63	00	0	0	0	0	0	0	0	0	0	0																				
8	5	63	700	0	0	700	0	0	0	20	20	20	0	28	3																		
8	20	63	2900	0	0	2880	0	0	0	0	0	20	20	28	5	44	2																
9	4	63	500	0	0	420	0	0	0	70	20	20	0	28	1																		
9	16	63	900	0	0	790	0	20	0	0	50	0	0	28	3																		

ORGANIC CHEMICALS

RECOVERED BY CARBON FILTER TECHNIQUE

RESULTS IN MICROGRAMS PER LITER
(Parts per billion)

STATE PENNSYLVANIA

MAJOR BASIN OHIO RIVER

MINOR BASIN MONONGAHELA RIVER

STATION LOCATION MONONGAHELA RIVER AT PITTSBURGH, PENNSYLVANIA 83

DATE OF SAMPLE BEGINNING MONTH	DAY	YEAR	END MONTH	DAY	GALLONS FILTERED	EXTRACTABLES TOTAL	CHLOROFORM	ALCOHOL	CHLOROFORM EXTRACTABLES ETHER INSOLUBLES	WATER SOLUBLES	NEUTRALS TOTAL	ALIPHATICS	AROMATICS	OXYGENATED COMPOUNDS	LOSS	WEAK ACIDS	STRONG ACIDS	BASES	LOSS
12	4	62	12	11	1734	410	118	292	4	30	44	10	4	25	5	14	7	1	18
1	4	63	1	11	1556	360	149	211	9	27	79	34	17	26	2	16	6	2	10
2	6	63	2	18	997	567	194	373	10	47	82	31	14	32	5	16	8	4	27
3	8	63	3	27	535	469	170	299	-	-	-	-	-	-	-	-	-	-	-
4	9	63	4	16	2129	423	150	273	8	27	83	41	16	26	0	14	9	3	6
5	7	63	5	16	3300	229	102	127	5	23	46	23	8	14	1	9	7	1	11
6	11	63	6	12	635*	-	-	-	-	-	-	-	-	-	-	-	-	-	-
7	2	63	7	3	*	-	-	-	-	-	-	-	-	-	-	-	-	-	-
8	6	63	8	13	5630	209	108	101	5	20	53	22	9	19	3	14	8	1	7
9	3	63	9	9	6480	109	60	49	4	9	32	12	8	11	1	8	3	0	4

* LOW FLOW

* FLOW UNKNOWN

CHEMICAL, PHYSICAL AND BACTERIOLOGICAL ANALYSES

STATE PENNSYLVANIA

MAJOR BASIN OHIO RIVER

MINOR BASIN MONONGAHELA RIVER

STATION LOCATION MONONGAHELA RIVER AT PITTSBURGH, PENNSYLVANIA 83

DATE OF SAMPLE			TEMP. (Degrees Centigrade)	DISSOLVED OXYGEN mg/l	pH	B.O.D. mg/l	C.O.D. mg/l	CHLORINE DEMAND		AMMONIA-NITROGEN mg/l	CHLORIDES mg/l	ALKALINITY mg/l	HARDNESS mg/l	COLOR (scale units)	TURBIDITY (scale units)	SULFATES mg/l	PHOSPHATES mg/l	TOTAL DISSOLVED SOLIDS mg/l	COLIFORMS per 100 ml.
MONTH	DAY	YEAR						1-HOUR mg/l	24-HOUR mg/l										
10	2	62	21.4	-	5.0	-	-	-	-	-	11		160	0	7	-	-	494	-
10	16	62	23.0	-	4.2	-	-	-	-	.3	11	1	165	1	10	297	-	360	-
10	22	62	18.8	-	4.7	-	-	-	-	.4	11		112	0	13	260	-	292	-
10	30	62	14.5	-	5.4	-	-	-	-	.5	10		114	0	13	244	-	298	-
11	7	62	14.2	-	6.1	-	-	-	-	-	13	4	62	0	8	140	-	159	-
11	20	62	10.0	-	6.7	-	-	-	-	.4	10	4	44	0	33	137	-	149	-
11	27	62	11.0	-	6.3	-	-	-	-	.1	6	5	58	0	42	69	-	134	-
12	4	62	11.0	-	6.4	-	-	-	-	.6	5	5	58	1	13	62	-	132	-
12	11	62	9.5	-	6.6	-	-	-	-	-	10	4	68	0	12	96	-	160	-
12	18	62	9.8	-	6.5	-	-	-	-	1.1	12	6	68	0	12	109	-	188	-
12	27	62	4.5	-	6.6	-	-	-	-	1.1	8	3	66	1	32	84	-	156	-
1	2	63	4.5	-	6.4	-	-	-	-	-	5	2	62	0	12	85	-	155	-
1	8	63	6.5	-	7.0	-	-	-	-	.3	7	5	80	0	11	72	-	168	-
1	15	63	4.5	-	6.1	-	-	-	-	.3	5	2	60	0	36	46	.0	141	-
1	22	63	6.0	-	7.2	-	-	-	-	.1	5	5	66	0	6	84	-	138	-
1	29	63	6.0	-	6.8	-	-	-	-	.1	6	7	68	0	4	93	-	179	1400
2	6	63	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1700
2	12	63	7.6	-	6.3	-	-	-	-	.1	7		88	0	94	-	-	219	-
2	13	63	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	*6
2	19	63	6.3	-	6.7	-	-	-	-	.4	14	7	80	1	15	112	-	200	1
3	5	63	10.0	-	7.0	-	-	-	-	.4	-	21	82	0	1400	97	-	-	4300
3	12	63	10.0	-	5.0	-	-	-	-	.4	-	5	88	0	85	93	-	156	730
3	19	63	9.6	-	6.1	-	-	-	-	.5	5	3	52	0	71	-	-	130	1000
3	26	63	14.6	-	5.6	-	-	-	-	.1	2	3	60	1	86	88	-	154	1000
4	2	63	16.0	-	5.3	-	-	-	-	.3	6	3	70	0	24	81	-	183	-
4	3	63	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	120
4	8	63	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	100
4	9	63	16.0	-	5.9	-	-	-	-	.3	10	2	98	0	22	96	-	-	-
4	16	63	15.0	-	6.4	-	-	-	-	.5	8	2	121	0	8	199	-	335	20
4	24	63	16.0	-	5.1	-	-	-	-	.4	8		144	0	14	202	-	276	120
4	30	63	17.5	-	5.0	-	-	-	-	.4	7	3	146	0	8	208	-	355	50
5	7	63	20.0	-	4.4	-	-	-	-	.4	11		162	3	12	223	-	400	-
5	15	63	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	73
6	11	63	26.0	-	5.1	-	-	-	-	.3	5	4	88	2	19	-	-	-	1600
6	18	63	24.0	-	6.5	-	-	-	-	.1	4	4	66	0	14	65	-	141	4600
6	24	63	26.0	-	6.3	-	-	-	-	.3	7	5	98	0	19	-	-	-	-
6	25	63	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1300

CHEMICAL, PHYSICAL AND BACTERIOLOGICAL ANALYSES

STATE PENNSYLVANIA

MAJOR BASIN OHIO RIVER

MINOR BASIN MONONGAHELA RIVER

STATION LOCATION MONONGAHELA RIVER AT PITTSBURGH, PENNSYLVANIA 83

DATE OF SAMPLE			TEMP. (Degrees Centigrade)	DISSOLVED OXYGEN mg/l	pH	B.O.D. mg/l	C.O.D. mg/l	CHLORINE DEMAND		AMMONIA-NITROGEN mg/l	CHLORIDES mg/l	ALKALINITY mg/l	HARDNESS mg/l	COLOR (cobalt units)	TURBIDITY (cobalt units)	SULFATES mg/l	PHOSPHATES mg/l	TOTAL DISSOLVED SOLIDS mg/l	COLIFORMS per 100 ml.
MONTH	DAY	YEAR						1-HOUR mg/l	24-HOUR mg/l										
7	2	63	30.0	-	6.3	-	-	-	-	.1	9	6	134	0	13	138	-	276	100
7	9	63	24.6	-	5.7	-	-	-	-	.5	9	4	112	0	11	-	-	260	200
7	16	63	26.0	-	6.0	-	-	-	-	.1	12	6	28	1	12	194	-	357	2300
7	23	63	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	440
7	30	63	32.0	-	5.1	-	-	-	-	.4	10	4	140	1	8	190	-	311	37
8	6	63	27.0	-	4.3	-	-	-	-	.3	14	2	180	0	14	272	-	449	180
8	13	63	26.0	-	4.6	-	-	-	-	.4	12	1	148	0	11	211	-	394	100
8	20	63	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	370
8	27	63	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	*3
9	4	63	26.2	-	5.8	-	-	-	-	.5	7	4	112	3	14	164	-	255	35
9	17	63	24.0	-	4.9	-	-	-	-	.4	10	4	122	0	14	166	-	338	22
9	24	63	21.4	.0	6.4	-	-	-	-	.4	10	5	128	0	11	151	-	268	-
9	25	63	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	53

STREAM FLOW DATA - 1962-1963

Thousand Cubic Feet per Second

PROVISIONAL--SUBJECT TO REVISION

Gaging Station at Braddock, Pennsylvania
Operated by U.S. Geological Survey

STATE: Pennsylvania

MAJOR BASIN: Ohio River

MINOR BASIN: Monongahela River

STATION LOCATION: Monongahela River at Pittsburgh, Pennsylvania

Day	October	November	December	January	February	March	April	May	June	July	August	September
1	3.960	20.000	6.000	16.600	5.400	6.550	15.600	5.850	3.450	2.610	2.680	4.960
2	3.520	17.000	5.640	14.600	5.520	22.700	13.500	6.100	2.890	3.150	2.780	3.020
3	3.380	16.000	4.960	15.600	10.500	33.200	11.800	6.800	2.470	13.300	2.820	2.610
4	3.170	11.800	5.720	13.200	26.800	41.600	9.300	6.050	3.580	13.100	3.340	3.760
5	4.080	9.900	4.920	10.800	22.400	123.000	8.100	5.080	9.690	5.900	9.750	7.360
6	5.900	8.400	5.400	8.400	25.000	149.000	7.550	4.120	27.000	5.280	9.680	7.800
7	5.120	6.500	5.600	6.050	23.200	105.000	6.500	4.920	21.600	4.400	5.950	5.950
8	3.660	5.800	5.280	6.250	19.600	64.500	5.560	4.680	19.600	3.170	4.760	5.280
9	4.030	5.480	4.680	6.200	15.600	49.700	6.050	4.200	17.000	3.200	4.240	3.600
10	6.250	7.010	4.280	7.050	9.900	45.100	6.250	3.730	12.400	2.780	3.760	3.730
11	6.100	19.100	4.300	11.800	9.900	46.200	6.200	3.560	28.400	2.750	3.380	3.880
12	4.880	30.400	4.300	25.900	14.900	45.100	5.680	3.560	49.600	2.640	3.100	3.700
13	4.480	19.200	4.300	45.100	17.000	58.100	5.000	3.240	23.800	2.540	3.480	3.480
14	4.000	16.600	4.300	41.800	14.200	55.700	4.760	3.700	17.000	2.720	3.560	3.280
15	3.620	17.000	4.300	30.400	11.800	50.900	3.920	3.880	12.400	2.470	4.720	3.100
16	4.160	16.000	4.480	25.900	9.300	42.900	4.000	7.010	10.500	2.610	5.080	2.920
17	3.840	16.000	4.440	20.800	7.300	42.900	4.320	6.800	7.050	2.470	4.280	3.140
18	3.700	11.100	5.320	17.400	5.950	54.500	5.000	7.800	5.950	2.920	3.700	3.060
19	3.880	14.900	7.800	13.500	9.300	45.100	6.000	9.600	4.480	2.920	2.860	2.780
20	3.730	18.400	10.200	10.500	11.400	98.700	9.600	10.200	4.000	2.860	2.750	2.680
21	3.560	17.400	14.600	8.700	10.800	103.000	8.720	10.800	4.040	2.540	3.150	2.540
22	3.310	19.600	16.600	10.800	12.400	55.700	5.200	10.500	4.800	2.330	4.600	2.120
23	3.450	30.400	26.900	10.200	10.200	47.300	6.680	8.700	4.200	3.170	4.320	1.910
24	3.420	28.600	25.900	8.100	8.400	44.000	9.600	9.000	3.310	3.620	4.120	2.470
25	3.420	25.000	20.800	6.050	7.550	42.900	10.200	7.800	3.520	3.880	3.560	2.330
26	3.520	22.400	17.000	6.200	7.050	42.900	8.100	4.800	3.340	4.080	2.860	1.910
27	3.590	20.000	18.000	6.250	5.900	42.900	7.800	3.880	2.780	3.920	2.860	1.630
28	3.200	16.000	16.600	5.760	5.480	40.700	6.050	5.320	2.680	3.310	2.320	1.660
29	3.000	11.100	16.600	6.050		35.200	4.520	4.880	2.680	2.680	3.100	1.660
30	4.050	7.800	17.000	5.950		30.400	5.850	3.730	3.100	2.860	3.700	1.880
31	11.300		16.300	5.280		24.100		3.170		2.750	4.000	

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OHIO RIVER AT CAIRO, ILLINOIS

Samples are taken from the municipal water treatment plant intake on the west bank of the Ohio River.

Between Cairo and the next upstream PHS Water Pollution Surveillance System station at Evansville, Indiana, municipal wastes from six cities, industrial wastes from refineries and canneries, and coal mine drainage are discharged to the river. All of the cities either have or are building sewage treatment plants.

Bottom samples were collected on May 16 and August 13, 1963. A large number of empty shells of the Asiatic clam (Corbicula fluminea) were found in May. The condition of the shells indicated recent mortality. A trawl sample in August yielded a large number of young living clams. This indicates that the Corbicula population is being re-established after a major clam kill in the Ohio River over the winter of 1962-1963.

The chlorinated hydrocarbon pesticide, dieldrin, has been identified in sampling from this station.

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Station Location: Ohio River at Cairo, Illinois

Major Basin: Ohio River

Minor Basin: Ohio River - Main Stem and Minor Tributary

Station at: 37°03' Latitude 89°10' Longitude

Miles above mouth: 3

Activation Date: April 7, 1958

Sampled by: Cairo Water Company

Field Analysis by: Cairo Water Company

Other Cooperating Agencies: Illinois State Department of Public Health

Hydrologic Data:

Nearest pertinent gaging station: At Metropolis, Illinois

Gaging station operated by: U.S. Geological Survey

Drainage area at gaging station: 203,000 square miles

Period of record: 1928 to present

Average discharge in record period: 260,100 cfs.

Maximum discharge in record period: 1,780,000 cfs.

Minimum discharge in record period: 20,600 cfs. (daily)

Remarks: Flows affected by operations of navigation locks and dams.

ALKYL BENZENE SULFONATE (ABS)

Date	mg/l
3-4-63	0.09
3-11-63	0.07
3-18-63	*0.02
3-25-63	0.04
4-1-63	0.04
4-15-63	0.05
7-1-63	0.06
7-8-63	0.06
7-22-63	0.17
7-29-63	0.14
8-12-63	0.21
8-19-63	0.09
8-26-63	0.08
9-9-63	0.12
9-16-63	0.09
9-27-63	0.09

ELEMENTAL ANALYSES

		Composite 10/1/62 to 12/31/62	Interval 4/1/63 to 6/30/63
Analysis by wet or flame methods. Results in mg/l	F	.28	.35
	Na	3.0	2.5
	K	20	13
Analysis by Spectrographic methods. Results in micrograms per liter	Zn	12	3
	Cd	*2	*2
	As	*22	*20
	B	36	28
	P	*11	*10
	Fe	25	8
	Mo	6	*5
	Mn	*.4	*2
	Al	—	30
	Be	*.06	*.05
	Cu	4	13
	Ag	*.4	*.5
	Ni	*1	*2
	Co	*4	*2
	Pb	11	*5
	Cr	*1	*5
	V	*2	*10
	Ba	69	40
	Sr	92	79

*Actual value is less than the amount shown. Reported result indicates limit of sensitivity at which test was performed. See text for explanation.

STRONTIUM 90 ACTIVITY

Composite Interval	pc/l	±	Composite Interval	pc/l	±
October to December	1.7	.3	April to June	2.9	.3
January to March	—	—	July to September	—	—

± at 95% Confidence Limits

SPECIFIC QUALITATIVE IDENTIFICATIONS FROM CARBON ADSORPTION EXTRACTS WATER YEAR 1962-3

Interval	Compound	Concentration* ug/l
8/18 - 8/29/63	Dieldrin	0.001
9/16 - 9/27/63	Dieldrin	0.016

*Concentration values, where shown, are calculated from quantitative gas chromatographic analysis of the aromatic fractions of CCE, and may be assigned the units of ug/l. In light of the unknown efficiency of carbon adsorption sampling for these compounds, the reported values represent minima, the actual values being equal to or greater than the reported values.
See page 21.

RADIOACTIVITY DETERMINATIONS

STATE ILLINOIS

MAJOR BASIN OHIO RIVER

MINOR BASIN OHIO RIVER-MAIN STEM & MINOR TRIB.

STATION LOCATION OHIO RIVER AT CAIRO, ILLINOIS

35

DATE SAMPLE TAKEN			DATE OF DETERMINATION		RADIOACTIVITY IN WATER												RADIOACTIVITY IN PLANKTON					
					ALPHA						BETA						DATE OF DETERMINATION		GROSS ACTIVITY			
					SUSPENDED		DISSOLVED		TOTAL		SUSPENDED		DISSOLVED		TOTAL				ALPHA		BETA	
MO	DAY	YR	MO	DAY	pc/l	±	pc/l	±	pc/l	±	pc/l	±	pc/l	±	pc/l	±	MO.	DAY	pc/g	±	pc/g	±
10	1	62	10	25	-	-	-	-	-	-	10	6	24	8	34	10						
10	8	62	11	9	0	0	1	1	1	1	3	4	15	5	18	6						
10	15	62	11	2	-	-	-	-	-	-	1	5	27	7	28	9						
10	22	62	11	20	-	-	-	-	-	-	6	7	20	9	26	11						
10	29	62	12	24	-	-	-	-	-	-	1	4	27	6	28	7						
11	26	62	12	15*	3	4	1	1	7	4	21	26	19	7	40	27						
12	17	62	1	30*	6	1	1	1	7	1	5	7	14	8	19	11						
1	28	63	2	26*	11	2	1	1	12	2	62	11	20	8	82	14						
2	25	63	3	11*	12	2	1	1	13	2	45	7	15	6	60	9						
3	4	63	3	22	2	1	0	1	2	1	28	8	19	8	47	11						
3	11	63	3	22	59	27	0	1	59	27	726	106	45	7	771	106						
3	18	63	4	4	11	6	0	1	11	6	131	36	38	7	169	37						
3	25	63	4	10	12	8	0	2	12	8	183	23	41	7	224	24						
4	1	63	4	18	4	2	0	1	4	2	76	9	40	7	116	11						
4	8	63	4	25	7	3	0	1	7	3	135	18	49	8	184	20						
4	15	63	5	1	8	2	2	2	10	3	21	8	50	9	71	12						
4	22	63	5	6	5	2	0	1	5	2	20	3	31	4	51	5						
4	29	63	5	15	5	1	0	1	5	1	41	8	28	8	69	11						
5	6	63	5	27	10	2	0	1	10	2	36	4	43	4	79	6						
5	13	63	5	27	3	1	0	1	3	1	22	3	37	4	59	5						
5	20	63	6	3	3	1	0	1	3	1	29	3	37	4	66	5						
5	27	63	6	7	6	2	0	1	6	2	51	8	43	8	94	11						
6	3	63	6	21	2	1	0	1	2	1	17	4	34	6	51	7						
6	10	63	6	24	0	2	0	1	0	2	30	4	24	4	54	6						
6	17	63	7	3	5	2	0	1	5	2	59	9	25	8	85	12						
6	24	63	7	2	1	1	0	1	1	1	8	6	30	7	38	9						
7	1	63	7	17	1	1	0	1	1	1	1	5	27	7	28	9						
7	8	63	7	31	1	1	0	1	1	1	8	2	30	7	38	9						
7	15	63	8	7	1	1	0	1	1	1	0	10	20	7	20	12						
7	22	63	8	7	1	1	0	1	1	1	5	6	21	8	26	10						
7	29	63	8	14	1	1	0	1	1	1	9	6	26	8	35	10						
8	5	63	8	13	1	1	0	1	1	1	2	3	16	3	19	4						
8	12	63	8	27	1	1	0	1	1	1	1	5	17	7	18	9						
8	19	63	9	6	1	1	0	1	1	1	0	11	17	7	17	13						
8	26	63	9	25	0	1	0	1	0	1	0	5	28	7	28	9						
9	2	63	9	20	0	1	0	1	0	1	0	5	17	6	17	8						
9	9	63	10	1	0	1	0	1	0	1	0	5	21	4	21	6						
9	16	63	10	4	0	1	0	1	0	1	0	7	21	7	21	10						
9	23	63	10	8	0	1	0	1	0	1	0	14	16	7	16	16						
9	30	63	10	17	0	1	1	1	1	1	0	11	20	7	20	13						

PLANKTON POPULATION

STATE ILLINOIS

MAJOR BASIN OHIO RIVER

MINOR BASIN OHIO RIVER-MAIN STEM & MINOR TRIB.

STATION LOCATION OHIO RIVER AT CAIRO, ILLINOIS 035

DATE OF SAMPLE			DOMINANT SPECIES OF DIATOMS AND PERCENT OF TOTAL DIATOMS (See text for Codes)									FUNGI AND SHEATHED BACTERIA Number per ml.	MICROINVERTEBRATES																					
			1ST		2ND		3RD		4TH				PROTOZOA (Heterotrophic) Number per ml.	ROTIFERS												CRUSTACEA								NEMATODES (Free-living) Number per liter	OTHER ANIMAL FORMS (Number per liter)
														NUMBER PER LITER	GENERA AND COUNT LEVEL (See text for Codes)										NUMBER PER LITER	GENERA AND COUNT LEVEL (See text for Codes)									
															1ST		2ND		3RD		4TH		5TH			1ST		2ND		3RD			
MONTH	DAY	YEAR	SPECIES	PERCENT	SPECIES	PERCENT	SPECIES	PERCENT	SPECIES	PERCENT	OTHER SPECIES PERCENT				GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL			GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL		
10	1	62	56	38	92	21	26	6	46	5	30			0											6	51	2					0	0
10	15	62	82	16	26	15	56	14	23	5	50			0											0							2	0
11	5	62	26	17	82	13	56	12	92	8	50			0											0							0	0
11	20	62	56	55	58	12	92	7	26	6	20			0											0							0	0
12	3	62	82	55	56	13	26	10	58	3	19			0											0							0	0
12	17	62	82	69	57	11	56	6	26	5	9			2											0							0	0
1	7	63	56	17	82	16	92	8	58	6	53			-											-							-	-
1	21	63	92	30	56	19	36	10	26	6	35			0											0							0	0
2	4	63	82	68	57	14	56	3	89	2	13			1											1							2	0
2	18	63	92	49	56	14	36	10	62	5	22			0											0							0	0
3	4	63	57	35	56	25	92	6	80	5	29			2											0							1	0
3	18	63	56	41	92	21	26	5	74	5	28			1											0							0	0
4	1	63	56	21	92	16	82	14	36	8	41			2											2							0	0
4	15	63	82	31	27	29	23	7	26	6	27			1											3							0	0
5	6	63	82	21	92	11	57	9	26	7	52			46	11	4									3	50	1					0	0
5	20	63	80	81	56	9	92	2	82	1	7			942	11	7	17	5	22	5	2	5			50	51	5					0	0
6	3	63	35	51	80	18	56	16	89	6	9			357	11	6	2	3							0							0	0
6	17	63	58	57	56	21	9	2	70	2	18			2											0							0	0
7	1	63	82	31	92	11	80	10	89	9	39			6											0							0	0
7	15	63												-											-							-	-
8	5	63	56	26	58	23	82	17	26	16	18			27	22	3									0							0	0
8	19	63												0											0							0	0
9	2	63												8	11	1									2							0	0
9	16	63	26	33	82	13	56	8	35	6	40			1											0							0	0

PLANKTON POPULATION

STATE ILLINOIS
MAJOR BASIN OHIO RIVER
MINOR BASIN OHIO RIVER-MAIN STEM & MINOR TRIB.
STATION LOCATION OHIO RIVER AT CAIRO, ILLINOIS 35

DATE OF SAMPLE			ALGAE (Number per milliliter)									INERT DIATOM SHELLS		MOST ABUNDANT ALGAE - Genera and Count Level per ml. (See text for Codes)																	
			TOTAL	BLUE-GREEN		GREEN		FLAGELLATED (Pigmented)		DIATOMS				1ST		2ND		3RD		4TH		5TH		6TH		7TH		8TH		9TH		10TH	
MONTH	DAY	YEAR		COCCOID	FILAMENTOUS	COCCOID	FILAMENT	GREEN	OTHER	CENTRIC	PENNATE	CENTRIC	PENNATE	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL
10	1	62	100	0	0	0	0	0	0	70	0	20	0																		
10	15	62	100	0	0	0	0	0	0	60	40	40	0																		
11	5	62	100	0	0	10	0	0	0	90	10	20	20																		
11	20	62	1100	0	20	20	0	70	0	920	90	950	430	69	3	68	1														
12	3	62	1700	0	0	40	0	0	0	890	790	80	0	69	2	92	1	88	1	87	1	71	1								
12	17	62	3100	0	0	100	0	0	0	2480	500	80	0	69	4	71	3														
1	7	63	1100	0	0	0	0	20	0	900	200	200	330	71	2	68	1														
1	21	63	400	0	0	20	0	40	0	150	180	460	550																		
2	4	63	500	0	0	40	0	110	0	260	70	20	70	71	1																
2	18	63	600	0	60	0	0	80	20	290	110	340	230																		
3	4	63	1100	0	0	0	0	0	90	920	110	70	110	71	2	69	2														
3	18	63	300	0	0	20	0	0	0	110	150	40	370																		
4	1	63	100	0	20	0	0	0	0	40	70	40	240																		
4	15	63	600	0	0	0	0	70	0	440	90	330	370	68	1																
5	6	63	1900	0	60	300	0	170	170	840	360	670	320	71	2	68	1														
5	20	63	14800	60	110	1220	0	130	80	12260	950	2270	170	71	6	69	5	38	2	77	2	91	1	92	1	26	1	68	1		
6	3	63	7200	0	0	420	0	130	0	2460	4140	2090	900	82	5	69	4	71	2	92	2	17	1								
6	17	63	1900	0	0	510	0	70	0	840	530	2550	1340	69	2	68	2	24	1												
7	1	63	3500	50	0	450	0	110	50	2280	520	430	360	71	4	69	3	92	2												
7	15	63	*	-	-	-	-	-	-	-	-	-	-																		
8	5	63	800	20	20	180	0	40	0	480	70	350	40	71	1	68	1	69	1												
8	19	63	400	20	0	240	0	0	0	90	20	190	20																		
9	2	63	200	0	0	20	0	0	0	110	90	40	20																		
9	16	63	200	0	0	50	0	0	20	140	0	70	50																		

* TOO TURBID TO COUNT

ORGANIC CHEMICALS

RECOVERED BY CARBON FILTER TECHNIQUE

RESULTS IN MICROGRAMS PER LITER
(Parts per billion)

STATE ILLINOIS

MAJOR BASIN OHIO RIVER

MINOR BASIN OHIO RIVER-MAIN STEM & MINOR TRIB.

STATION LOCATION OHIO RIVER AT CAIRO, ILLINOIS

35

DATE OF SAMPLE BEGINNING MONTH	DAY	YEAR	END MONTH	DAY	GALLONS FILTERED	EXTRACTABLES TOTAL	CHLORO-FORM	ALCOHOL	CHLOROFORM EXTRACTABLES ETHER INSOLUBLES	WATER SOLUBLES	NEUTRALS TOTAL	ALIPHATICS	AROMATICS	OXYGEN-ATED COMPOUNDS	LOSS	WEAK ACIDS	STRONG ACIDS	BASES	LOSS
12	6	62	12	17	5009	153	41	112	2	10	16	2	2	12	0	6	3	1	3
1	16	63	1	25	3876	172	60	112	4	9	29	5	4	19	1	6	2	1	9
2	15	63	2	25	3177	228	104	124	9	24	40	6	5	28	1	8	7	2	14
3	20	63	3	28	3518	203	59	144	1	15	21	2	3	15	1	6	3	1	12
4	9	63	4	19	2473	226	83	143	2	18	35	7	5	21	2	11	4	2	11
5	9	63	5	18	1271	390	137	253	3	32	51	5	4	40	2	21	10	2	18
6	24	63	7	4	2541	315	127	188	7	33	36	3	3	29	1	17	12	2	20
7	19	63	7	29	4604	135	56	79	1	14	19	1	2	16	0	7	5	1	9
8	18	63	8	29	4347	214	70	144	2	19	20	2	1	17	0	7	7	2	13
9	16	63	9	27	5120	153	54	104	2	16	14	2	1	11	0	5	5	2	10

CHEMICAL, PHYSICAL AND BACTERIOLOGICAL ANALYSES

STATE ILLINOIS

MAJOR BASIN OHIO RIVER

MINOR BASIN OHIO RIVER-MAIN STEM & MINOR TRIB.

STATION LOCATION OHIO RIVER AT CAIRO, ILLINOIS

35

DATE OF SAMPLE			TEMP. (Degrees Centigrade)	DISSOLVED OXYGEN mg/l	pH	B.O.D. mg/l	C.O.D. mg/l	CHLORINE DEMAND		AMMONIA-NITROGEN mg/l	CHLORIDES mg/l	ALKALINITY mg/l	HARDNESS mg/l	COLOR (scale units)	TURBIDITY (scale units)	SULFATES mg/l	PHOSPHATES mg/l	TOTAL DISSOLVED SOLIDS mg/l	COLIFORMS per 100 ml.
MONTH	DAY	YEAR						1-HOUR mg/l	24-HOUR mg/l										
10	1	62	22.0	9.5	7.5	.5	-	.2	1.2	.2	21	54	102	-	25	-	-	-	600
10	8	62	22.0	9.1	7.5	1.5	-	.2	1.8	.2	32	78	158	-	80	-	-	-	600
10	15	62	23.0	9.5	7.5	1.2	-	.2	2.0	.3	38	60	100	-	40	-	-	-	2000
10	22	62	20.1	10.4	7.5	1.2	-	.2	2.1	.2	26	65	116	-	35	-	-	-	1200
10	29	62	16.8	11.9	7.2	1.2	-	.2	1.8	.2	25	63	110	-	25	-	-	-	-
10	30	62	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	100
11	4	62	13.0	12.1	7.5	1.1	-	.2	2.0	.4	26	75	134	-	25	-	-	-	-
11	5	62	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1000
11	13	62	11.8	14.5	7.5	2.8	-	.2	2.1	1.0	57	76	210	-	175	-	-	-	3300
11	19	62	11.2	12.9	7.3	3.8	-	.2	1.5	1.4	54	68	220	-	480	-	-	-	20000
11	26	62	12.0	13.4	7.3	3.8	-	.2	2.0	1.0	28	66	144	-	200	-	-	-	6600
12	3	62	10.4	14.2	7.3	4.2	-	.2	1.8	.3	26	63	132	-	150	-	-	-	3900
12	10	62	6.0	12.6	7.4	3.6	-	.3	2.0	.4	23	70	120	-	70	-	-	-	2200
12	17	62	4.6	12.2	7.4	2.6	-	.2	2.2	.3	22	62	104	-	80	-	-	-	9200
1	7	63	3.8	12.2	7.3	2.4	-	.3	2.2	.7	24	60	116	-	270	-	-	-	5300
1	14	63	3.0	13.1	7.3	4.1	-	.2	2.1	.3	19	64	156	-	140	-	-	-	5200
1	21	63	1.8	10.2	7.4	3.9	-	.3	2.1	.4	20	63	140	-	350	-	-	-	32000
1	28	63	.6	12.6	7.5	3.7	-	.2	2.4	.5	20	58	120	-	90	-	-	-	*330
2	4	63	1.0	13.6	7.4	3.4	-	.3	2.2	.5	24	68	134	-	45	-	-	-	-
2	11	63	2.6	12.6	7.3	2.2	-	.2	2.3	1.0	21	63	120	-	170	-	-	-	5000
2	18	63	3.0	12.2	7.3	3.2	-	.3	2.8	1.7	26	72	140	-	154	-	-	-	1000
2	25	63	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	100
2	27	63	3.0	13.1	7.5	3.4	-	.4	2.9	1.8	25	65	140	-	140	-	-	-	-
3	7	63	5.0	11.6	7.3	1.8	-	.5	3.0	1.9	23	63	146	-	590	-	-	-	-
3	11	63	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	15000
3	13	63	6.0	10.5	7.3	3.4	-	.6	3.0	2.0	16	55	120	-	800	-	-	-	-
3	18	63	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	500
3	20	63	9.0	10.4	7.3	1.3	-	.7	3.2	1.7	17	44	100	-	340	-	-	-	-
3	27	63	10.0	10.2	7.2	1.4	-	.8	1.3	1.4	13	52	100	-	350	-	-	-	-
3	28	63	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	100
4	1	63	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	*100
4	3	63	12.0	9.4	7.0	-	-	.9	1.3	-	17	56	110	-	175	-	-	-	-
4	8	63	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	14000
4	10	63	14.8	8.3	7.4	2.0	-	.3	2.2	.4	15	75	132	-	200	-	-	-	-
4	15	63	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	500
4	17	63	15.0	10.0	7.5	2.5	-	.4	2.3	.0	4	86	146	-	170	-	-	-	-
4	24	63	19.0	10.0	7.7	2.2	-	.4	2.4	.0	20	92	160	-	80	-	-	-	-
4	29	63	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	900
5	1	63	18.0	9.9	7.5	1.7	-	.3	2.3	.4	20	90	158	-	240	-	-	-	-

CHEMICAL, PHYSICAL AND BACTERIOLOGICAL ANALYSES

STATE ILLINOIS
MAJOR BASIN OHIO RIVER
MINOR BASIN OHIO RIVER-MAIN STEM & MINOR TRIB.
STATION LOCATION OHIO RIVER AT
CAIRO, ILLINOIS 35

DATE OF SAMPLE			TEMP. (Degrees Centigrade)	DISSOLVED OXYGEN mg/l	pH	B.O.D. mg/l	C.O.D. mg/l	CHLORINE DEMAND		AMMONIA-NITROGEN mg/l	CHLORIDES mg/l	ALKALINITY mg/l	HARDNESS mg/l	COLOR (scale units)	TURBIDITY (scale units)	SULFATES mg/l	PHOSPHATES mg/l	TOTAL DISSOLVED SOLIDS mg/l	COLIFORMS per 100 ml.
MONTH	DAY	YEAR						1-HOUR mg/l	24-HOUR mg/l										
5	6	63	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	500
5	8	63	20.0	9.5	7.7	1.8	-	.3	2.3	.2	21	93	170	-	110	-	-	-	-
5	13	63	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	*100
5	15	63	22.5	10.2	8.2	2.1	-	.4	2.4	.0	10	94	154	-	60	-	-	-	-
5	20	63	22.0	9.9	7.7	2.4	-	.5	2.5	.0	17	86	160	-	90	-	-	-	*100
5	27	63	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	500
5	29	63	21.0	9.2	7.5	2.2	-	.3	2.3	.2	19	76	128	-	90	-	-	-	-
6	3	63	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	*100
6	5	63	26.0	7.6	7.7	1.1	-	.2	2.2	.1	20	88	156	-	75	-	-	-	-
6	10	63	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	700
6	12	63	28.5	7.0	7.7	1.6	-	.3	2.2	.2	26	75	156	-	105	-	-	-	-
6	17	63	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	*100
6	19	63	26.0	6.6	7.5	1.4	-	.2	2.3	.2	25	70	144	-	110	-	-	-	-
6	24	63	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1800
6	26	63	27.5	1.3	7.5	.8	-	.3	2.4	.2	23	65	120	-	58	-	-	-	-
7	5	63	28.9	6.1	7.6	5.5	-	.3	-	.2	17	70	112	-	30	-	-	-	-
7	8	63	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5000
7	10	63	28.0	7.5	7.5	.7	-	2.2	-	.1	18	67	110	-	45	-	-	-	-
7	15	63	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	600
7	17	63	20.3	7.4	7.7	.6	-	-	-	.2	22	60	100	-	50	-	-	-	-
7	22	63	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2000
7	24	63	29.0	7.4	7.9	.4	-	2.3	-	.3	24	63	108	-	45	-	-	-	-
7	29	63	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	500
7	31	63	28.5	7.3	7.5	.3	-	2.2	-	.1	10	64	106	-	35	-	-	-	-
8	5	63	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	*100
8	7	63	29.5	7.2	7.5	.2	-	2.3	-	.0	19	70	118	-	90	-	-	-	-
8	14	63	28.5	7.1	7.5	.6	-	2.1	-	.0	17	60	96	-	35	-	-	-	700
8	21	63	26.2	6.6	7.5	7.4	-	.2	2.2	.2	14	57	84	-	25	-	-	-	2300
8	26	63	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	*100
8	28	63	27.8	5.2	7.5	-	-	-	-	.1	9	56	94	-	25	-	-	-	-
9	2	63	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	100
9	4	63	27.0	6.5	7.5	.2	-	.3	2.4	.1	9	63	100	-	37	-	-	-	-
9	9	63	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5000
9	11	63	27.4	6.5	7.5	.1	-	.3	2.3	.1	10	60	92	-	25	-	-	-	-
9	16	63	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	*100
9	18	63	26.0	7.5	7.5	.5	-	.2	2.2	.2	-	65	100	-	25	-	-	-	-
9	23	63	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	*100
9	25	63	24.0	8.0	7.6	.2	-	.3	2.0	.1	10	65	108	-	25	-	-	-	-
9	30	63	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2100

STREAM FLOW DATA - 1962-1963

Thousand Cubic Feet per Second

PROVISIONAL--SUBJECT TO REVISION

Gaging Station at Metropolis, Illinois
Operated by U.S. Geological Survey

STATE: Illinois

MAJOR BASIN: Ohio River

MINOR BASIN: Ohio River-Main Stem & Minor Trib.

STATION LOCATION: Ohio River at Cairo, Illinois

Day	October	November	December	January	February	March	April	May	June	July	August	September
1	75.600	96.400	220.000	247.000	140.000	180.000	943.000	352.000	141.000	83.900	110.000	98.900
2	82.100	104.000	151.000	243.000	135.000	159.000	878.000	403.000	154.000	92.800	99.500	83.800
3	96.800	108.000	102.000	244.000	132.000	175.000	831.000	390.000	162.000	113.000	98.000	65.900
4	135.000	110.000	108.000	250.000	163.000	207.000	784.000	320.000	149.000	109.000	112.000	82.700
5	137.000	112.000	113.000	255.000	195.000	261.000	736.000	244.000	125.000	107.000	114.000	90.700
6	138.000	119.000	118.000	245.000	203.000	381.000	689.000	220.000	129.000	117.000	115.000	93.800
7	131.000	111.000	128.000	219.000	211.000	501.000	631.000	201.000	127.000	107.000	119.000	75.500
8	120.000	89.000	137.000	175.000	231.000	617.000	572.000	191.000	133.000	102.000	113.000	69.600
9	120.000	92.500	143.000	116.000	244.000	669.000	510.000	130.000	150.000	93.900	92.300	66.400
10	113.000	98.900	140.000	125.000	264.000	697.000	452.000	135.000	171.000	95.800	91.100	79.200
11	92.400	129.000	137.000	140.000	269.000	731.000	391.000	139.000	196.000	95.800	96.700	80.400
12	87.400	166.000	127.000	140.000	263.000	789.000	341.000	139.000	200.000	86.200	97.000	76.100
13	93.400	177.000	109.000	154.000	255.000	878.000	317.000	119.000	208.000	84.700	97.400	85.000
14	95.800	196.000	105.000	174.000	244.000	959.000	289.000	120.000	199.000	98.400	96.000	83.000
15	93.700	221.000	103.000	204.000	226.000	1.020.000	252.000	132.000	176.000	109.000	84.000	76.500
16	91.900	247.000	91.400	205.000	217.000	1.050.000	207.000	141.000	170.000	101.000	75.300	77.600
17	89.700	263.000	84.300	218.000	217.000	1.050.000	146.000	150.000	200.000	95.300	81.200	74.600
18	112.000	262.000	91.600	248.000	213.000	1.120.000	138.000	149.000	191.000	98.800	79.800	72.600
19	112.000	245.000	101.000	272.000	199.000	1.150.000	127.000	137.000	126.000	96.900	79.000	66.700
20	90.800	230.000	114.000	277.000	187.000	1.130.000	129.000	155.000	110.000	102.000	93.400	66.800
21	81.600	213.000	119.000	267.000	141.000	1.110.000	123.000	191.000	115.000	117.000	78.100	67.500
22	87.600	202.000	131.000	248.000	148.000	1.100.000	129.000	187.000	102.000	124.000	71.300	51.200
23	93.300	201.000	147.000	232.000	163.000	1.100.000	134.000	190.000	111.000	119.000	79.100	46.500
24	92.600	197.000	172.000	204.000	165.000	1.100.000	149.000	193.000	112.000	122.000	73.200	69.100
25	91.700	203.000	191.000	166.000	175.000	1.100.000	153.000	185.000	105.000	128.000	84.400	41.600
26	87.400	202.000	202.000	151.000	195.000	1.100.000	161.000	136.000	109.000	116.000	78.700	46.000
27	84.400	204.000	239.000	144.000	201.000	1.080.000	190.000	162.000	102.000	114.000	82.700	59.700
28	74.700	217.000	280.000	150.000	193.000	1.070.000	202.000	197.000	99.200	118.000	73.700	52.700
29	91.800	232.000	298.000	} 140.000		1.040.000	219.000	197.000	98.000	116.000	89.300	55.200
30	101.000	235.000	288.000			1.020.000	261.000	193.000	86.300	101.000	113.000	56.400
31	83.800		270.000			991.000		154.000		91.500	104.000	

OHIO RIVER AT EVANSVILLE, INDIANA

This sampling point is located at the intake of the Evansville Waterworks Department. Uniontown Lock and Dam, authorized for construction by the Corps of Engineers approximately 50 miles below this station, will raise the normal pool elevation at Evansville about three feet.

There are no significant industrial discharges above this station. In the reach of river between Evansville and the next upstream surveillance station at Louisville, Kentucky, there are three major municipal discharges of primary effluent to the river from a connected population estimated at 480,000.

High counts of 2,008 rotifers per liter representing six genera occurred at Evansville on July 1, 1963. A count of 165 copepods per liter was also found. The presence of these forms indicates a plentiful supply of organic materials.

Infrared spectra of the aromatic fraction of samples from this station showed adsorption peaks characteristic of alkyl-substituted diphenyl ether. These peaks were identical with those at upstream stations as far as Winfield Dam on the Kanawha River, a distance of over 500 miles.

Bottom samples were collected on May 17 and August 15, 1963. Identification of organisms and analysis of the data are incomplete.

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Station Location: Ohio River at Evansville, Indiana

Major Basin: Ohio River

Minor Basin: Ohio River - Main Stem and Minor Tributary

Station at: 37°58' Latitude 87°34' Longitude

Miles above mouth: 190

Activation Date: January 1, 1958

Sampled by: Evansville Water Department

Field Analysis by: Evansville Water Department

Other Cooperating Agencies: Indiana State Board of Health

Hydrologic Data:

Nearest pertinent gaging station: Evansville, Indiana

Gaging station operated by: U.S. Geological Survey

Drainage area at gaging station: 107,000 square miles

Period of record: 1936 to present

Average discharge in record period: 133,900 cfs.

Maximum discharge in record period: 1,410,000 cfs.

Minimum discharge in record period: Not Determined

Remarks: Flows affected by operations of navigation locks and dams.

ALKYL BENZENE SULFONATE (ABS)

Date	mg/l
3-4-63	0.09
3-11-63	0.07
3-18-63	0.06
3-25-63	0.06
4-1-63	0.04
4-8-63	0.10
4-15-63	0.08
4-22-63	0.06
4-29-63	0.07
5-6-63	0.06
5-13-63	0.06
5-20-63	0.06
5-27-63	0.04
6-3-63	0.04
6-10-63	0.07
6-17-63	0.05
7-8-63	0.06
7-22-63	0.08
7-29-63	0.10
8-5-63	0.08
8-12-63	0.08
8-19-63	0.09
8-26-63	0.08
9-9-63	0.13
9-30-63	0.11

ELEMENTAL ANALYSES

		Composite Interval 10/1/62 to 12/31/62	Composite Interval 4/1/63 to 6/30/63
Analysis by wet or flame methods. Results in mg/l	F	.23	.25
	Na	27	14
	K	3.7	2.7
Analysis by Spectrographic methods. Results in micrograms per liter	Zn	65	10
	Cd	*3	*2
	As	*30	*22
	B	56	36
	P	*15	*11
	Fe	23	5
	Mo	15	*5
	Mn	*.6	*2.2
	Al	—	16
	Be	*.07	*.05
	Cu	4	9
	Ag	*.6	*.05
	Ni	*2	*2
	Co	*6	*2
	Pb	15	*5
	Cr	*2	*5
	V	*3	*11
	Ba	121	52
	Sr	134	91

*Actual value is less than the amount shown. Reported result indicates limit of sensitivity at which test was performed. See text for explanation.

STRONTIUM 90 ACTIVITY

Composite Interval	pc/l	±	Composite Interval	pc/l	±
October to December	1.6	.3	April to June	—	—
January to March	—	—	July to September	4.2	.4

± at 95% Confidence Limits

SPECIFIC QUALITATIVE IDENTIFICATIONS FROM CARBON ADSORPTION EXTRACTS WATER YEAR 1962-3

Interval	Compound	Concentration* ug/l

*Concentration values, where shown, are calculated from quantitative gas chromatographic analysis of the aromatic fractions of CCE, and may be assigned the units of ug/l. In light of the unknown efficiency of carbon adsorption sampling for these compounds, the reported values represent minima, the actual values being equal to or greater than the reported values.
See page 21.

RADIOACTIVITY DETERMINATIONS

STATE INDIANA

MAJOR BASIN OHIO RIVER

MINOR BASIN OHIO RIVER-MAIN STEM & MINOR TRIB.

STATION LOCATION OHIO RIVER AT EVANSVILLE, INDIANA 36

DATE SAMPLE TAKEN			RADIOACTIVITY IN WATER												RADIOACTIVITY IN PLANKTON					
			DATE OF DETERMINATION	ALPHA					BETA						DATE OF DETERMINATION	GROSS ACTIVITY				
				SUSPENDED		DISSOLVED		TOTAL	SUSPENDED		DISSOLVED		TOTAL			ALPHA		BETA		
MO	DAY	YR	MO DAY	pc/l	±	pc/l	±	pc/l	±	pc/l	±	pc/l	±	pc/l	±	MO DAY	pc/g	±	pc/g	±
10	1	62	10 25	-	-	-	-	-	-	2	5	15	8	17	9					
10	8	62	11 7	1	1	3	2	4	2	2	5	15	8	17	9					
10	15	62	11 28	-	-	-	-	-	-	12	6	27	9	39	11					
10	22	62	12 3	-	-	-	-	-	-	5	5	16	8	21	10					
10	29	62	12 19	-	-	-	-	-	-	407	20	14	15	421	25					
11	26	62	12 12*	1	1	0	1	1	1	34	9	34	9	68	13					
12	17	62	1 16*	0	1	0	1	0	1	9	7	20	8	29	11					
1	21	63	2 26*	2	2	0	1	2	2	41	11	12	8	53	14					
2	25	63	3 11*	1	1	0	1	1	1	36	7	16	6	52	9					
3	25	63	4 15*	4	3	0	1	4	3	76	8	15	3	91	8					
4	29	63	5 22*	2	2	1	1	3	2	30	15	25	8	55	17					
5	27	63	6 10*	1	1	1	1	2	1	24	7	32	9	56	11					
6	24	63	7 15*	0	0	0	0	0	0	8	3	25	4	33	5					
7	29	63	8 19*	0	1	0	1	0	1	13	3	30	4	43	5					
8	26	63	9 25*	0	0	0	1	0	1	4	5	34	9	38	10					
9	30	63	10 23*	1	1	1	2	2	2	2	6	21	9	23	11					

PLANKTON POPULATION

STATE INDIANA
MAJOR BASIN OHIO RIVER
MINOR BASIN OHIO RIVER-MAIN STEM & MINOR TRIB.
STATION LOCATION OHIO RIVER AT
EVANSVILLE, INDIANA 036

DATE OF SAMPLE			DOMINANT SPECIES OF DIATOMS AND PERCENT OF TOTAL DIATOMS (See text for Codes)									FUNGI AND SHEATHED BACTERIA Number per ml.	MICROINVERTEBRATES																					
			1ST		2ND		3RD		4TH		OTHER SPECIES PERCENT		PROTOZOA (Vanes/cubic) Number per ml.	ROTIFERS												CRUSTACEA								NEMATODES (Vanes/cubic) Number per liter	OTHER ANIMAL FORMS (Number per liter)
															GENERA AND COUNT LEVEL (See text for Codes)												GENERA AND COUNT LEVEL (See text for Codes)							
MONTH	DAY	YEAR	SPECIES	PERCENT	SPECIES	PERCENT	SPECIES	PERCENT	SPECIES	PERCENT				NUMBER PER LITER	1ST		2ND		3RD		4TH		5TH		NUMBER PER LITER	1ST		2ND		3RD			
															GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL		GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL		
10	1	62	26	68	56	9	82	5	58	3	15		-	68	11	3	21	3	17	2					33	51	4	50	2	77	1	0	1
10	15	62	56	45	26	19	58	7	82	6	23		-	3											0							0	0
11	5	62	56	69	10	17	58	8	26	1	5		-	0											0							0	0
11	19	62	56	73	92	13	26	6	58	4	4		-	0											0							0	0
12	3	62	82	26	56	16	57	16	26	9	33		-	1											0							0	0
12	17	62	57	35	56	14	82	14	26	6	31	30	-	-											0							0	0
1	7	63	56	11	57	9	58	7	92	6	67		-	0											0							0	0
1	21	63	56	36	92	14	82	13	89	8	29		-	-											-							-	-
2	4	63	56	26	57	12	82	9	70	6	47		-	0											0							0	0
2	18	63	92	30	56	18	36	5	26	5	42		-	0											0							0	0
3	4	63											-	0											0							0	0
3	18	63	56	25	92	19	26	7	36	4	45		-	0											0							2	0
4	1	63	92	28	56	20	36	13	26	4	35		-	0											1							0	0
4	15	63	92	29	36	17	62	9	56	9	36		-	0											0							0	0
5	6	63	82	40	9	23	57	14	56	5	18		-	86	11	4	21	2	2	1	17	1	22	1	42	50	4	51	2	76	2	2	0
5	20	63	56	50	45	17	47	8	92	6	19		-	120	11	5	2	1	9	1					54	50	4	51	3	76	2	0	0
6	3	63	35	56	56	9	57	9	92	8	18		-	2											1							0	0
6	17	63	56	33	58	30	35	7	89	7	23		-	19	11	2									2							0	0
7	1	63	47	25	92	16	58	8	82	8	43		-	2010	17	8	11	7	22	4	46	4	21	2	165	76	5	50	4	53	3	0	0
7	16	63	56	35	58	29	82	10	92	9	17		-	7	17	1									2							0	0
8	5	63	58	62	56	9	47	8	53	6	15		-	32	22	2	17	2	2	1					3							0	0
8	19	63	80	47	58	26	47	8	56	7	12		-	75	22	3	11	3	17	2					0							0	0
9	3	63	82	21	26	20	56	17	58	17	25		-	714	11	7	17	6	16	5	22	3	15	1	7	50	2					1	0
9	16	63	58	62	47	14	56	7	26	5	12		-	71	22	4	17	2	2	2					1							0	0

PLANKTON POPULATION

STATE INDIANA

MAJOR BASIN OHIO RIVER

MINOR BASIN OHIO RIVER-MAIN STEM & MINOR TRIB.

STATION LOCATION OHIO RIVER AT EVANSVILLE, INDIANA 36

DATE OF SAMPLE			ALGAE (Number per milliliter)								INERT DIATOM SHELLS		MOST ABUNDANT ALGAE - Genera and Count Level per ml (See text for Codes)																	
			TOTAL	BLUE-GREEN		GREEN		FLAGELLATED (Pigmented)		DIATOMS			1ST		2ND		3RD		4TH		5TH		6TH		7TH		8TH		9TH		10TH	
MONTH	DAY	YEAR		COCCOID	FILAMENTOUS	COCCOID	FILAMENTOUS	GREEN	OTHER	CENTRIC	PENNATE	CENTRIC	PENNATE	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL
1	1	62	400	0	0	0	0	230	0	90	90	0	0	51	1																
10	15	62	400	0	0	110	0	60	0	200	70	110	0																		
11	5	62	1000	0	0	40	0	0	0	540	370	250	40	69	2	97	2														
11	19	62	800	0	0	110	0	0	0	590	140	930	540	69	2																
12	3	62	1000	0	0	120	0	0	0	660	230	330	0	69	1																
12	17	62	200	0	0	20	0	50	0	120	30	20	20																		
1	7	63	300	0	0	0	0	0	0	160	160	70	20																		
1	21	63	900	0	0	40	0	20	0	480	370	840	530	69	2	92	1														
2	4	63	300	0	20	0	0	0	0	220	70	0	40																		
2	18	63	200	0	0	0	0	0	20	110	110	90	90																		
3	4	63	00	0	0	0	0	0	10	0	10	0	30																		
3	18	63	400	0	0	20	0	20	20	80	250	340	360																		
4	1	63	200	0	0	0	0	0	0	90	70	20	150																		
4	15	63	500	0	40	60	0	110	20	230	60	80	250																		
5	6	63	800	0	40	70	0	70	0	480	150	220	150	69	1	71	1														
5	20	63	5500	0	110	840	0	110	170	3650	610	1010	150	71	4	69	4	77	1	30	1	38	1	92	1						
6	3	63	11200	0	270	2040	0	340	340	4220	3950	1110	190	77	4	69	4	82	4	68	3	71	3	26	3	92	2	38	2	51	2	63	1
6	17	63	2800	20	220	710	0	110	110	1010	670	1010	60	69	3	77	1	38	1	17	1	68	1	92	1								
7	1	63	300	0	0	80	0	40	0	190	0	100	0																		
7	16	63	1900	0	0	410	640	170	20	600	80	20	20	50	3	71	2	31	1	68	1										
8	5	63	4600	60	0	1970	270	400	20	1640	210	150	190	69	4	34	3	24	3	50	1	38	1	51	1						
8	19	63	16600	1380	0	12030	30	590	0	2140	390	1110	320	24	6	44	5	71	3	3	3	69	3	38	2	59	2	2	2	35	1	45	1
9	3	63	6100	150	20	1060	120	1180	0	1840	640	480	40	69	4	51	3	24	2	50	2	88	1	68	1	71	1	38	1				
9	16	63	5000	430	270	1970	320	570	20	1110	290	70	110	69	3	34	3	51	2	2	2	50	2	24	1	16	1	38	1	68	1	31	1

736-496 O - 64 - 7

ORGANIC CHEMICALS

RECOVERED BY CARBON FILTER TECHNIQUE

RESULTS IN MICROGRAMS PER LITER
(Parts per billion)

STATE: INDIANA
MAJOR BASIN: OHIO RIVER
MINOR BASIN: OHIO RIVER-MAIN STEM & MINOR TRIB.
STATION LOCATION: OHIO RIVER AT EVANSVILLE, INDIANA

36

DATE OF SAMPLE BEGINNING MONTH	DAY	YEAR	END MONTH	DAY	GALLONS FILTERED	EXTRACTABLES TOTAL	CHLORO-FORM	ALCOHOL	CHLOROFORM EXTRACTABLES ETHER INSOLUBLES	WATER SOLUBLES	NEUTRALS TOTAL	ALIPHATICS	AROMATICS	OXYGEN-ATED COMPOUNDS	LOSS	WEAK ACIDS	STRONG ACIDS	BASES	LOSS
10	1	62	10	11	5225	287	137	150	1	33	44	1	2	39	2	16	18	3	22
11	1	62	11	19	4492	316	179	137	2	38	77	4	5	66	2	22	16	5	19
12	3	62	1	2	3405#	527	165	362	3	35	74	3	8	60	3	18	12	5	18
3	1	63	3	11	5245	201	54	147	1	8	30	2	4	22	2	5	2	2	6

ESTIMATED

CHEMICAL, PHYSICAL AND BACTERIOLOGICAL ANALYSES

STATE INDIANA

MAJOR BASIN OHIO RIVER

MINOR BASIN OHIO RIVER-MAIN STEM & MINOR TRIB.

STATION LOCATION OHIO RIVER AT EVANSVILLE, INDIANA 36

DATE OF SAMPLE			TEMP. (Degrees Centigrade)	DISSOLVED OXYGEN mg/l	pH	B.O.D. mg/l	C.O.D. mg/l	CHLORINE DEMAND		AMMONIA-NITROGEN mg/l	CHLORIDES mg/l	ALKALINITY mg/l	HARDNESS mg/l	COLOR (scale units)	TURBIDITY (scale units)	SULFATES mg/l	PHOSPHATES mg/l	TOTAL DISSOLVED SOLIDS mg/l	COLIFORMS per 100 ml.
MONTH	DAY	YEAR						1-HOUR mg/l	24-HOUR mg/l										
10	3	62	20.0	11.1	7.5	-	24	-	-	.2	51	58	150	-	15	105	.5	-	-
10	8	62	-	-	-	-	-	-	-	-	28	28	-	5	*25	115	-	290	-
10	10	62	20.0	10.8	7.4	-	26	-	-	.2	44	66	152	-	40	105	.3	-	-
10	17	62	21.0	9.6	7.4	1.2	25	.9	-	.5	53	72	178	-	24	105	.2	-	-
10	24	62	18.0	-	7.6	-	24	.9	-	.3	59	73	182	-	17	135	.2	-	-
10	30	62	19.0	10.2	7.6	-	24	-	-	.6	63	72	195	-	13	105	.4	-	-
11	7	62	14.0	-	7.4	-	-	-	-	-	72	73	216	-	25	105	.5	-	-
11	14	62	14.0	-	7.2	-	-	-	-	-	36	40	215	-	300	105	.5	-	-
11	19	62	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	16000
11	21	62	11.0	-	7.2	-	-	-	-	-	27	41	161	-	150	105	.7	-	-
11	26	62	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	11000
11	28	62	10.0	-	7.2	-	-	-	-	-	25	24	131	-	167	105	.9	-	-
12	3	62	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2600
12	5	62	10.0	-	7.2	-	-	-	-	-	20	50	113	-	37	101	1.2	-	-
12	10	62	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	*100
12	12	62	6.0	14.2	7.3	-	21	-	-	.7	17	46	102	-	37	105	.4	-	-
12	17	62	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	7500
12	19	62	9.0	14.7	7.3	-	20	.9	-	.5	17	43	104	5	24	105	.5	-	-
1	7	63	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2200
1	14	63	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5100
1	21	63	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3400
1	28	63	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	300
2	4	63	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	100
2	11	63	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4100
2	18	63	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3000
2	25	63	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3700
3	4	63	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4000
3	25	63	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	20000
4	1	63	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	29000
4	8	63	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	7700
4	15	63	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	8000
4	22	63	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	9000
4	24	63	17.0	7.2	7.7	3.2	26	-	-	.2	11	64	164	25	30	105	.3	-	-
4	29	63	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	9000
5	1	63	15.0	8.6	7.7	3.2	20	1.6	-	.6	15	77	166	0	85	110	.4	-	-
5	6	63	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3800
5	8	63	20.0	11.0	7.8	-	-	.8	-	-	17	76	183	0	28	105	.2	-	-
5	15	63	21.0	9.7	-	-	3	.8	-	.1	16	76	184	0	39	105	.2	-	-
5	22	63	21.0	11.2	7.7	-	2	-	-	-	17	75	161	-	85	105	.3	-	-

CHEMICAL, PHYSICAL AND BACTERIOLOGICAL ANALYSES

STATE INDIANA
MAJOR BASIN OHIO RIVER
MINOR BASIN OHIO RIVER-MAIN STEM & MINOR TRIB.
STATION LOCATION OHIO RIVER AT
EVANSVILLE, INDIANA 36

DATE OF SAMPLE			TEMP. (Degrees Centigrade)	DISSOLVED OXYGEN mg/l	pH	B.O.D. mg/l	C.O.D. mg/l	CHLORINE DEMAND		AMMONIA-NITROGEN mg/l	CHLORIDES mg/l	ALKALINITY mg/l	HARDNESS mg/l	COLOR (scale units)	TURBIDITY (scale units)	SULFATES mg/l	PHOSPHATES mg/l	TOTAL DISSOLVED SOLIDS mg/l	COLIFORMS per 100 ml.
MONTH	DAY	YEAR						1-HOUR mg/l	24-HOUR mg/l										
5	22	63	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	11000
5	29	63	22.0	14.0	7.9	-	2	1.9	-	.3	13	86	168	5	83	105	.2	-	-
6	0	63	24.0	14.2	7.8	-	2	1.9	-	.1	18	73	167	0	17	105	.2	-	-
6	10	63	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	9300
6	13	63	26.0	8.6	7.7	-	-	2.4	-	.2	18	66	160	0	70	105	.4	-	-
6	17	63	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2600
6	19	63	26.0	8.9	7.8	2.9	5	2.9	-	.1	17	45	162	0	50	105	.4	-	-
6	24	63	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2000
6	27	63	27.0	10.1	8.3	3.5	6	1.7	-	.1	26	55	128	0	58	105	.2	-	-
7	1	63	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	500
7	5	63	28.0	7.0	7.6	4.2	7	1.8	-	.3	33	58	145	0	37	102	.1	-	-
7	8	63	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3000
7	11	63	27.0	7.9	7.7	2.5	-	1.3	-	.2	31	59	139	0	36	110	.2	-	-
7	15	63	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2000
7	18	63	25.0	8.7	7.6	3.2	7	2.8	-	.1	16	47	152	0	50	105	.7	-	-
7	22	63	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1000
7	25	63	28.0	9.0	8.1	3.0	7	1.8	-	.2	26	47	138	0	24	105	.2	-	-
7	29	63	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1900
8	2	63	20.0	.9	8.1	5.2	9	1.9	-	.2	25	69	139	5	26	105	.1	-	-
8	5	63	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	500
8	9	63	29.0	9.2	8.0	4.7	7	1.3	-	.1	31	52	150	15	21	105	.3	-	-
8	12	63	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	300
8	16	63	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	100
8	26	63	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	800
9	3	63	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
9	9	63	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3200
9	16	63	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2300
9	23	63	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	200
9	25	63	22.0	10.5	8.0	3.5	24	-	-	.1	50	64	165	0	13	105	.0	-	-
9	30	63	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	300

STREAM FLOW DATA - 1962-1963

Thousand Cubic Feet per Second

PROVISIONAL--SUBJECT TO REVISION

Gaging Station at Evansville, Indiana
Operated by U.S. Geological Survey

STATE	Indiana
MAJOR BASIN	Ohio River
MINOR BASIN	Ohio River-Main Stem & Minor Trib.
STATION LOCATION	Ohio River at Evansville, Indiana

October	November	December	January	February	March	April	May	June	July	August	September
DATA	NOT	AVAILABLE	AT	PRESENT	TIME						

FISH POPULATION

State: Indiana
Major basin: Ohio River
Minor basin: Ohio River—Main stem and minor tributaries
Station location: Ohio River at Evansville, Ind.

		Collecting method											
		Rotenone						Electric shocker					
Sampling date(s)		Aug. 12, 1963						Aug. 13 and 14, 1963					
Total number of fish		237						1,440					
Total weight of fish (pounds)		2.7						24.7					
Group	Species collected	Percent of total		Length range (inches) number of fish				Percent of total		Length range (inches) number of fish			
		Number	Weight	0–4	5–8	9–12	Over 12	Number	Weight	0–4	5–8	9–12	Over 12
I	Skipjack	9.3	16.2					2.5	10.1				
	Smallmouth bass							.1	<.1				
	Spotted bass							.3	1.9				
	Largemouth bass							.1	.2				
		9.3	16.2					3.0	12.2				
II	Emerald shiner	59.1	5.4					74.2	9.0				
	River shiner	.8	.2					16.4	2.5				
	Spotfin shiner	.4	.1					.2	.1				
	Green sunfish							.4	.4				
	Bluegill	.4	<.1					.1	.2				
	Longear sunfish							.1	.4				
		60.7	5.7					91.4	12.6				
III	Gizzard shad	17.3	44.3					3.°	40.2				
	Threadfin shad	6.8	2.0					.4	.2				
		24.1	46.3					4.2	40.4				
IV	Freshwater drum	5.1	31.7					.1	.8				
		5.1	31.7					.1	.8				

FISH POPULATION—Continued

State: Indiana
Major basin: Ohio River
Minor basin: Ohio River—Main stem and minor tributaries
Station location: Ohio River at Evansville, Ind.

		Collecting method											
		Rotenone						Electric shocker					
Sampling date(s)		Aug. 12, 1963						Aug. 13 and 14, 1963					
Total number of fish		237						1,440					
Total weight of fish (pounds)		2.7						24.7					
Group	Species collected	Percent of total		Length range (inches) number of fish				Percent of total		Length range (inches) number of fish			
		Number	Weight	0–4	5–8	9–12	Over 12	Number	Weight	0–4	5–8	9–12	Over 12
V	River carpsucker	0.4	0 1	.....	.....	.....	.....	0.2	18.4	.....	.....	.....	.....
	Quillback carpsucker	.....	.....	.....	.....	.....	.....	.1	4.0	.....	.....	.....	.....
		.4	.1	.....	.....	.....	.....	.3	22.4	.....	.....	.....	.....
VI	Channel catfish	.4	<.1	.....	.....	.....	.....	.2	1.3	.....	.....	.....	.....
	Flathead catfish	.....	.....	.....	.....	.....	.....	.7	9.2	.....	.....	.....	.....
	American eel	.....	.....	.....	.....	.....	.....	.1	1.1	.....	.....	.....	.....
		.4	<.1	.....	.....	.....	.....	1.0	11.6	.....	.....	.....	.....

OHIO RIVER AT LOUISVILLE, KENTUCKY

Samples are collected at the municipal water plant intake. This station is located on the south bank of the river five miles upstream from McAlpin Lock and Dam and approximately 138 miles downstream from the pollution surveillance station at Cincinnati.

The nearest significant waste discharges are the three Cincinnati primary treatment plants which serve a population of an estimated 675,000. The river is used as a source of municipal water supply for Louisville, Kentucky. Barge traffic on the river is heavy. The Ohio River in this area sustains high recreational use for boating, waterskiing and fishing.

Samples of bottom animals were collected at this station in October 1962, May and August 1963. Approximately 10 species of animals, including a variety of mollusca, suggest a balanced benthic community in this reach of river.

Infrared spectra of aromatic fractions of carbon adsorption method samples collected during the period September 1962 to March 1963 showed adsorption peaks characteristic of alkyl-substituted diphenyl ether.

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Station Location: Ohio River at Louisville, Kentucky

Major Basin: Ohio River

Minor Basin: Ohio River - Main Stem and Minor Tributary

Station at: 38°17' Latitude 85°42' Longitude

Miles above mouth: 370

Activation Date: June 14, 1961

Sampled by: Louisville Water Company

Field Analysis by: Louisville Water Company

Other Cooperating Agencies:

Hydrologic Data:

Nearest pertinent gaging station: At Louisville, Kentucky

Gaging station operated by: U.S. Geological Survey

Drainage area at gaging station: 91,170 square miles

Period of record: 1928 to present

Average discharge in record period: 113,700 cfs.

Maximum discharge in record period: 1,110,000 cfs.

Minimum discharge in record period: 2,100 cfs. (daily)

Remarks: Medium and low flows affected by operations of navigation locks and dams, and of power plants.

ALKYL BENZENE SULFONATE (ABS)

Date	mg/l
4-2-63	0.05
4-9-63	0.06
4-16-63	0.06
4-24-63	0.07
4-29-63	0.07
5-6-63	0.05
5-13-63	0.05
5-20-63	0.05
5-27-63	0.06
6-3-63	0.04
6-10-63	0.04
6-17-63	0.05
6-24-63	0.08
7-1-63	0.08
7-8-63	0.09
7-15-63	0.09
7-22-63	0.09
7-29-63	0.12
8-5-63	0.13
8-12-63	0.10
8-19-63	0.10
8-26-63	0.09
9-3-63	0.11
9-9-63	0.12
9-30-63	0.15

ELEMENTAL ANALYSES

		Composite Interval 10/1/62 to 12/31/62	Composite Interval 4/1/63 to 6/30/63
Analysis by wet or flame methods. Results in mg/l	F	.33	.25
	Na	30	14
	K	3.7	2.6
Analysis by Spectrographic methods. Results in micrograms per liter	Zn	13	3
	Cd	*3	*2
	As	*30	*22
	B	64	33
	P	27	*11
	Fe	170	6
	Mo	30	*6
	Mn	*.6	*2.2
	Al	—	17
	Be	*.07	*.06
	Cu	2	7
	Ag	*.6	*.6
	Ni	*2	*2
	Co	*6	*2
	Pb	15	*6
	Cr	*2	*6
	V	*3	*11
	Ba	179	55
	Sr	164	99

*Actual value is less than the amount shown. Reported result indicates limit of sensitivity at which test was performed. See text for explanation.

STRONTIUM 90 ACTIVITY

Composite Interval	pc/l	±	Composite Interval	pc/l	±
October to December	1.4	.2	April to June	2.3	.3
January to March	—	—	July to September	3.6	.7

± at 95% Confidence Limits

SPECIFIC QUALITATIVE IDENTIFICATIONS FROM CARBON ADSORPTION EXTRACTS WATER YEAR 1962-3

Interval	Compound	Concentration* ug/l

*Concentration values, where shown, are calculated from quantitative gas chromatographic analysis of the aromatic fractions of CCE, and may be assigned the units of ug/l. In light of the unknown efficiency of carbon adsorption sampling for these compounds, the reported values represent minima, the actual values being equal to or greater than the reported values.
See page 21.

RADIOACTIVITY DETERMINATIONS

STATE KENTUCKY

MAJOR BASIN OHIO RIVER

MINOR BASIN OHIO RIVER-MAIN STEM & MINOR TRIB.

STATION LOCATION OHIO RIVER AT LOUISVILLE, KENTUCKY 84

DATE SAMPLE TAKEN			RADIOACTIVITY IN WATER														RADIOACTIVITY IN PLANKTON					
			DATE OF DETERMINATION		ALPHA						BETA						DATE OF DETERMINATION		GROSS ACTIVITY			
					SUSPENDED		DISSOLVED		TOTAL		SUSPENDED		DISSOLVED		TOTAL				ALPHA		BETA	
MO.	DAY	YR.	MO.	DAY	pc/l	±	pc/l	±	pc/l	±	pc/l	±	pc/l	±	pc/l	±	MO.	DAY	pc/g	±	pc/g	±
10	2	62	10	24	-	-	-	-	-	-	10	10	18	15	28	18						
10	9	62	11	9	-	-	-	-	-	-	6	11	26	14	32	18						
10	16	62	11	28	-	-	-	-	-	-	6	11	19	12	25	16						
10	23	62	12	17	-	-	-	-	-	-	6	8	14	11	20	14						
10	30	62	12	24	-	-	-	-	-	-	14	9	22	11	36	14						
11	27	62	12	12*	1	1	0	1	1	1	34	8	24	9	58	12						
12	26	62	1	16*	2	1	0	1	2	1	22	8	12	8	34	11						
1	25	63	4	4*	2	1	0	1	2	1	25	8	20	7	45	11						
2	25	63	3	20*	1	1	0	1	1	1	27	7	15	8	42	11						
4	29	63	5	24*	0	1	0	1	0	1	10	6	15	8	25	10						
5	27	63	6	21*	0	1	0	1	0	1	17	4	30	6	47	7						
6	24	63	7	30*	0	0	1	1	1	1	12	7	26	8	38	11						
7	29	63	8	21*	0	0	0	1	0	1	1	5	17	8	18	9						
8	26	63	10	4*	0	0	0	2	0	2	4	6	33	9	37	11						
9	30	63	11	6*	0	1	0	2	0	2	4	6	29	10	33	12						

PLANKTON POPULATION

STATE KENTUCKY

MAJOR BASIN OHIO RIVER

MINOR BASIN OHIO RIVER-MAIN STEM & MINOR TRIB.

STATION LOCATION OHIO RIVER AT LOUISVILLE, KENTUCKY 084

DATE OF SAMPLE			DOMINANT SPECIES OF DIATOMS AND PERCENT OF TOTAL DIATOMS (See text for Codes)									FUNGI AND SHEATHED BACTERIA Number per ml.	MICROINVERTEBRATES																					
			1ST		2ND		3RD		4TH				PROTOZOA (Flagellates) Number per ml.	ROTIFERS										CRUSTACEA								NEMATODES (Adults/cubic) Number per liter	OTHER ANIMAL PHYLA (Number per liter)
														NUMBER PER LITER	GENERA AND COUNT LEVEL (See text for Codes)										NUMBER PER LITER	GENERA AND COUNT LEVEL (See text for Codes)									
															1ST		2ND		3RD		4TH		5TH				1ST		2ND		3RD			
MONTH	DAY	YEAR	SPECIES	PERCENT	SPECIES	PERCENT	SPECIES	PERCENT	SPECIES	PERCENT	OTHER SPECIES PERCENT				GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL			GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL		
10	2	62	56	42	82	19	26	9	58	5	25	-	-	0											0							0	0
10	16	62	82	51	56	18	26	7	58	6	18	-	-	54	21	3	17	1	11	1					51	51	5	53	1			0	0
11	5	62	56	43	26	11	92	7	58	5	34	20	0	0											1							0	0
11	20	62	27	25	56	22	57	10	58	10	33	-	-	4											0							0	0
12	4	62	56	35	57	14	92	9	26	6	36	140	0	0											0							0	0
12	18	62	57	33	82	28	9	16	56	12	11	100	-	1											0							0	0
1	2	63	92	12	56	10	36	8	26	6	64	-	-	0											0							0	0
1	15	63	36	25	56	17	92	17	82	9	32	-	-	-											-							-	-
2	12	63	92	21	56	9	51	7	36	5	58	-	-	0											0							0	0
2	19	63										10	-	0											0							0	0
4	2	63	56	28	92	17	36	13	26	9	33	-	-	0											0							0	0
4	16	63	82	47	27	8	57	6	56	3	36	-	-	-											-							-	-
5	6	63	82	37	57	13	9	10	92	6	34	-	-	-											-							-	-
5	20	63	35	17	56	14	57	6	58	1	62	-	-	-											-							-	-
6	3	63	35	83	92	4	56	3	91	3	7	-	-	-											-							-	-
6	17	63	58	33	56	27	23	10	26	6	24	-	-	-											-							-	-
7	1	63	58	98	82	1	89	1				-	-	-											-							-	-
7	15	63	89	40	58	33	56	9	82	8	10	-	-	1820	22	8	17	7	21	6	11	5	2	2	9	50	2					0	0
8	5	63	58	59	56	26	82	7			8	-	-	1240	17	7	22	6	21	5	11	4	2	4	12	50	3					0	0
8	19	63	56	76	58	5					19	-	-	42	17	2	22	2	11	1					3	50	1					0	0

PLANKTON POPULATION

STATE KENTUCKY

MAJOR BASIN OHIO RIVER

MINOR BASIN OHIO RIVER-MAIN STEM & MINOR TRIB.

STATION LOCATION OHIO RIVER AT LOUISVILLE, KENTUCKY 84

DATE OF SAMPLE			ALGAE (Number per milliliter)									INERT DIATOM SHELLS		MOST ABUNDANT ALGAE - Genera and Count Level per ml. (See text for Codes)																	
				BLUE-GREEN		GREEN		FLAGELLATED (Pigmented)		DIATOMS				1ST		2ND		3RD		4TH		5TH		6TH		7TH		8TH		9TH		10TH	
MONTH	DAY	YEAR	TOTAL	COCCOID	FILAMENTOUS	COCCOID	FILAMENTOUS	GREEN	OTHER	CENTRIC	PENNATE	CENTRIC	PENNATE	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL
10	2	62	200	0	0	0	0	0	0	140	20	20	0																		
10	16	62	4800	40	20	0	0	810	1570	2070	330	250	0	60	4	69	3	71	3	51	3										
11	5	62	100	0	0	0	0	0	0	40	10	60	20																		
11	20	62	900	0	0	40	0	0	20	540	290	120	80	69	2																
12	4	62	100	0	0	30	0	0	0	110	0	140	0																		
12	18	62	1400	0	40	80	0	190	40	870	190	40	40	51	1																
1	2	63	400	0	0	20	0	0	0	180	200	90	370																		
1	15	63	400	0	0	0	0	0	0	40	400	180	310	92	1	82	1														
2	12	63	100	0	0	20	0	0	0	0	40	90	240																		
2	19	63	300	0	0	10	0	0	140	60	80	130	150																		
4	2	63	200	0	0	0	0	20	0	40	90	40	180																		
4	16	63	900	0	40	40	0	110	270	190	250	170	40																		
5	6	63	600	0	40	200	0	130	0	200	70	40	20	69	1																
5	20	63	800	0	0	20	0	40	0	400	350	330	240	69	1																
6	3	63	3900	0	360	860	0	290	270	610	1530	130	190	82	4	71	2	24	1	51	1	63	1	69	1	15	1				
6	17	63	1400	20	20	550	0	110	20	530	110	380	150	69	2	38	1	24	1												
7	1	63	400	0	0	70	0	20	0	340	0	90	20																		
7	15	63	1100	0	0	210	0	350	0	230	330	40	20	51	1																
8	5	63	1400	0	0	170	40	410	0	730	60	0	40	69	2	51	2														
8	19	63	12900	90	450	11720	40	70	0	370	20	430	40	24	7	22	2	34	2	45	1	69	1	38	1						

ORGANIC CHEMICALS

RECOVERED BY CARBON FILTER TECHNIQUE

RESULTS IN MICROGRAMS PER LITER
(Parts per billion)

STATE KENTUCKY

MAJOR BASIN OHIO RIVER

MINOR BASIN OHIO RIVER-MAIN STEM & MINOR TRIB.

STATION LOCATION OHIO RIVER AT
LOUISVILLE, KENTUCKY

84

DATE OF SAMPLE BEGINNING MONTH	DAY	YEAR	END MONTH	DAY	GALLONS FILTERED	EXTRACTABLES TOTAL	CHLORO-FORM	ALCOHOL	CHLOROFORM EXTRACTABLES ETHER INSOLUBLES	WATER SOLUBLES	NEUTRALS TOTAL	ALIPHATICS	AROMATICS	OXYGEN-ATED COMPOUNDS	LOSS	WEAK ACIDS	STRONG ACIDS	BASES	LOSS
10	2	62	10	11	5036	321	119	202	2	27	44	2	2	38	2	13	13	4	16
11	5	62	11	13	5193	289	93	196	2	21	35	2	2	30	1	12	10	3	10
12	5	62	12	14	5198	207	58	149	1	14	24	2	2	19	1	6	4	1	8
1	2	63	1	10	5175	167	36	131	1	7	18	2	2	14	0	4	2	1	3
2	5	63	2	14	5295	153	45	108	1	8	23	4	4	14	1	5	2	1	5
3	5	63	3	20	3451	195	48	147	1	7	28	5	5	15	3	5	2	1	4
4	2	63	4	16	2553	293	93	200	3	20	38	7	6	25	0	11	8	1	12
5	6	63	5	20	5085	294	137	157	4	32	45	4	3	36	2	18	17	1	20
6	3	63	6	17	4599#	201	81	120	4	20	24	2	2	20	0	11	9	1	12
7	1	63	7	15	1218	767	306	461	18	69	86	4	8	67	7	34	40	6	53
8	5	63	8	14	4979	299	155	144	9	37	45	2	2	38	3	21	23	3	17
9	3	63	9	11	4982	277	147	130	8	40	40	1	1	36	2	17	21	3	18

ESTIMATED

CHEMICAL, PHYSICAL AND BACTERIOLOGICAL ANALYSES

STATE KENTUCKY

MAJOR BASIN OHIO RIVER

MINOR BASIN OHIO RIVER-MAIN STEM & MINOR TRIB.

STATION LOCATION OHIO RIVER AT LOUISVILLE, KENTUCKY 84

DATE OF SAMPLE			TEMP. (Degrees Centigrade)	DISSOLVED OXYGEN mg/l	pH	B.O.D. mg/l	C.O.D. mg/l	CHLORINE DEMAND		AMMONIA-NITROGEN mg/l	CHLORIDES mg/l	ALKALINITY mg/l	HARDNESS mg/l	COLOR (cobalt units)	TURBIDITY (silica units)	SULFATES mg/l	PHOSPHATES mg/l	TOTAL DISSOLVED SOLIDS mg/l	COLIFORMS per 100 ml.
MONTH	DAY	YEAR						1-HOUR mg/l	24-HOUR mg/l										
10	2	62	20.0	-	7.0	.8	24	1.6	2.8	-	65	56	180	0	6	130	.2	419	400
10	9	62	19.4	5.4	7.2	2.2	27	.7	1.9	-	59	59	184	0	8	130	.2	365	300
10	16	62	21.6	6.4	6.9	2.7	28	-	9.4	-	78	56	192	0	7	170	.1	544	1600
10	23	62	20.0	5.0	7.0	2.5	27	7.3	7.8	-	81	54	200	0	7	162	.1	450	1000
10	30	62	16.1	7.2	7.0	1.8	24	5.2	5.8	-	95	46	224	0	6	196	.1	496	1000
11	5	62	12.2	7.2	6.8	1.2	24	9.8	10.7	-	69	45	202	0	6	170	.2	436	3900
11	13	62	10.5	4.5	7.1	3.1	39	6.3	6.9	-	56	50	180	0	200	113	.1	337	17000
11	20	62	10.0	7.8	7.0	2.5	15	3.5	3.8	-	26	40	108	0	60	78	.1	234	3200
11	27	62	8.9	8.9	7.0	1.6	-	4.3	4.9	-	25	42	112	0	95	80	.1	208	750
12	4	62	8.9	8.0	7.1	1.1	22	1.6	3.7	-	17	39	96	0	35	56	.1	153	2000
12	11	62	4.4	10.6	7.2	-	20	4.2	4.9	-	22	44	110	0	9	70	.1	170	2200
12	18	62	3.3	10.1	7.1	-	9	5.0	5.9	-	26	41	110	0	7	82	.2	190	200
12	26	62	2.2	9.2	7.1	1.2	-	5.4	5.9	-	32	43	120	0	200	73	.1	193	3200
1	2	63	1.6	11.2	7.1	2.5	19	3.5	3.9	-	19	44	100	0	180	60	.6	140	11000
1	8	63	2.7	11.8	7.0	1.2	16	4.1	4.9	-	19	39	104	0	45	80	.1	199	1000
1	15	63	1.6	10.8	7.2	2.0	29	4.0	5.9	-	23	74	124	0	130	71	.3	188	5400
1	22	63	1.6	11.8	7.1	1.4	21	4.4	4.9	-	21	57	104	0	75	78	.1	169	1200
2	12	63	1.1	12.2	7.2	2.4	27	4.2	4.9	-	25	63	104	0	100	70	.1	211	14000
2	19	63	2.2	11.2	7.2	1.8	15	4.8	5.9	.6	20	69	110	0	55	70	.1	189	2000
2	26	63	2.2	11.5	7.5	1.4	13	2.8	4.9	.5	22	63	106	0	18	78	.2	142	50
4	2	63	10.5	9.3	7.3	1.0	25	2.4	2.9	.3	15	61	104	0	130	65	.2	199	14000
4	9	63	12.2	9.2	7.3	1.3	29	1.3	2.9	.2	13	73	106	0	60	64	.1	179	1900
4	16	63	13.3	9.2	7.4	.5	15	2.4	2.9	.3	16	77	118	0	10	58	.1	283	*200
4	23	63	15.5	9.5	7.5	1.5	15	2.3	2.9	.3	20	80	134	0	6	85	.5	230	7600
4	29	63	16.1	9.2	7.4	2.1	14	3.5	3.9	.4	27	80	154	0	18	85	.2	230	1800
5	6	63	16.6	8.6	7.4	1.2	13	3.5	3.9	.4	27	91	162	0	6	102	.1	254	*200
5	13	63	18.3	8.9	7.6	1.7	15	1.5	2.9	.2	26	64	154	0	5	98	.1	242	-
5	27	63	19.4	7.8	7.5	1.6	-	2.6	2.9	.2	31	61	136	0	5	85	.2	390	490
6	3	63	21.6	8.9	7.4	2.5	17	3.4	4.9	.3	26	55	120	0	8	69	.1	-	290
6	10	63	19.4	6.0	7.3	1.6	14	2.6	2.9	.2	24	54	116	0	120	79	.1	218	6600
6	17	63	18.3	6.8	7.3	1.4	13	1.7	1.9	.1	20	40	100	0	18	68	.1	166	1600
6	24	63	24.4	9.5	7.6	1.2	18	1.5	5.7	.1	33	48	134	0	7	95	.1	254	3000
7	1	63	26.6	10.6	7.6	2.0	13	1.6	-	.1	24	48	118	0	8	88	.1	213	50
7	8	63	26.1	7.0	7.4	1.5	15	1.6	3.0	.2	17	56	126	0	10	92	.1	207	1000
7	15	63	26.1	6.4	7.5	1.7	-	2.5	2.9	.3	21	57	138	0	4	95	.1	251	2000
7	22	63	27.2	9.5	7.9	2.2	18	.8	4.7	.3	25	56	136	0	6	95	.1	256	2000
7	29	63	27.7	8.6	7.8	2.1	17	2.4	3.0	.3	25	62	134	0	4	84	.1	239	*200

CHEMICAL, PHYSICAL AND BACTERIOLOGICAL ANALYSES

STATE KENTUCKY
MAJOR BASIN OHIO RIVER
MINOR BASIN OHIO RIVER-MAIN STEM & MINOR TRIB.
STATION LOCATION OHIO RIVER AT
LOUISVILLE, KENTUCKY 84

DATE OF SAMPLE			TEMP. (Degrees Centigrade)	DISSOLVED OXYGEN mg/l	pH	B.O.D. mg/l	C.O.D. mg/l	CHLORINE DEMAND		AMMONIA-NITROGEN mg/l	CHLORIDES mg/l	ALKALINITY mg/l	HARDNESS mg/l	COLOR (Hazen units)	TURBIDITY (Jackson units)	SULFATES mg/l	PHOSPHATES mg/l	TOTAL DISSOLVED SOLIDS mg/l	COLIFORMS per 100 ml.
MONTH	DAY	YEAR						1-HOUR mg/l	24-HOUR mg/l										
8	5	63	28.3	8.9	7.8	2.3	16	.8	1.0	.1	28	67	140	0	5	87	.1	259	1800
8	12	63	28.9	8.0	7.5	3.1	17	3.5	3.9	.3	37	63	148	0	4	82	.1	266	1000
8	19	63	26.6	7.0	7.8	-	23	2.5	2.9	.2	39	60	148	0	2	93	.1	271	430
8	26	63	26.6	7.4	7.7	1.6	13	1.7	4.5	.1	43	52	152	0	3	100	.1	287	700
9	3	63	26.1	6.6	7.2	1.7	12	1.5	5.3	.2	56	56	160	0	4	91	.1	327	7800
9	9	63	25.5	8.6	7.3	2.1	15	1.7	7.0	.2	58	53	176	0	4	118	.1	342	1600
9	16	63	23.9	6.6	7.3	2.2	13	1.6	4.6	.3	57	63	174	0	4	106	.1	361	-
9	23	63	23.3	6.8	7.5	1.7	13	1.9	4.6	.2	46	58	170	0	3	95	.1	391	340
9	30	63	21.7	7.2	7.5	1.8	10	1.6	1.9	.1	49	60	172	0	3	108	.0	355	-

STREAM FLOW DATA - 1962-1963

Thousand Cubic Feet per Second

PROVISIONAL--SUBJECT TO REVISION

Gaging Station at Louisville, Kentucky
Operated by U.S. Geological Survey

STATE: Kentucky

MAJOR BASIN: Ohio River

MINOR BASIN: Ohio River-Main Stem & Minor Trib.

STATION LOCATION: Ohio River at Louisville, Kentucky

Day	October	November	December	January	February	March	April	May	June	July	August	September
1	5.850	32.900	34.300	154.000	40.900	64.200	330.000	69.200	75.400	13.500	13.800	8.800
2	26.600	50.500	15.800	163.000	47.100	114.000	308.000	59.800	65.300	29.800	18.900	9.850
3	33.600	54.500	28.800	136.000	58.600	138.000	278.000	57.000	52.500	20.900	18.400	12.900
4	32.600	53.300	26.900	104.000	74.400	191.000	245.000	57.600	41.000	24.000	28.600	24.000
5	29.400	36.500	27.800	76.500	115.000	389.000	212.000	57.200	37.000	30.900	44.900	12.200
6	25.700	34.400	39.900	64.900	168.000	463.000	186.000	49.600	61.300	28.200	43.500	11.600
7	30.600	30.400	47.700	49.800	173.000	495.000	169.000	46.700	93.900	11.400	37.900	17.500
8	30.100	24.900	51.300	49.200	139.000	519.000	157.000	37.400	143.000	19.800	14.000	12.500
9	30.000	29.700	51.700	46.500	121.000	545.000	141.000	40.900	150.000	19.300	21.300	13.700
10	30.500	49.000	44.300	41.100	106.000	553.000	128.000	41.500	137.000	15.800	16.900	11.400
11	15.800	107.000	34.300	54.900	98.900	559.000	112.000	34.800	96.900	8.870	22.600	8.840
12	27.600	144.000	34.200	82.900	88.200	555.000	87.400	34.300	85.900	10.500	15.800	14.300
13	13.200	191.000	33.400	114.000	85.700	538.000	65.600	35.200	82.400	11.900	16.800	13.400
14	18.800	184.000	23.800	157.000	99.200	534.000	64.200	66.900	95.300	17.600	11.100	12.200
15	11.400	163.000	15.900	190.000	112.000	534.000	66.600	74.000	99.700	19.400	20.500	7.840
16	17.600	134.000	19.200	198.000	105.000	554.000	47.400	49.200	78.800	8.590	9.880	8.350
17	23.700	102.000	30.500	186.000	72.600	582.000	47.400	43.600	48.400	15.200	13.800	6.220
18	14.200	74.800	32.300	165.000	61.900	586.000	50.500	73.000	35.400	10.000	13.700	7.110
19	9.800	80.100	32.600	139.000	47.500	582.000	51.300	79.300	35.400	17.600	19.200	14.200
20	15.300	109.000	37.700	123.000	49.700	584.000	45.700	101.000	20.200	23.000	26.200	10.800
21	15.500	103.000	57.400	90.800	53.000	587.000	70.300	115.000	30.000	32.700	14.100	7.410
22	14.300	105.000	78.900	68.600	84.900	587.000	79.800	85.300	35.500	18.400	15.700	8.230
23	13.700	110.000	152.000	68.900	99.800	575.000	101.000	68.700	32.700	26.000	12.700	6.670
24	8.460	130.000	190.000	70.700	109.000	566.000	123.000	63.000	45.200	33.300	19.300	9.020
25	11.800	123.000	197.000	68.700	101.000	541.000	130.000	44.300	26.700	19.100	14.000	6.750
26	10.100	164.000	173.000	62.900	82.300	523.000	128.000	40.700	25.700	18.800	9.200	6.640
27	11.600	141.000	140.000	56.200	67.400	495.000	120.000	42.800	17.300	18.000	16.200	9.130
28	13.200	110.000	109.000	52.100	57.100	454.000	103.000	35.900	17.200	23.300	14.600	8.380
29	23.700	69.000	96.900	49.400		417.000	82.100	33.300	13.600	9.840	17.200	7.620
30	11.400	52.800	117.000	41.900		380.000	73.800	57.000	21.800	24.800	10.800	8.700
31	22.800		130.000	41.900		347.000		80.800		20.600	6.640	

FISH POPULATION

State: Kentucky
Major basin: Ohio River
Minor basin: Ohio River—Main stem and minor tributaries
Station location: Ohio River at Louisville, Ky.

		Collecting method											
		Rotenone						Electric shocker					
Sampling date(s)		Aug. 22, 1963						Oct. 10, 1963					
Total number of fish		1,572						858					
Total weight of fish (pounds)		39.4						69.4					
Group	Species collected	Percent of total		Length range (inches) number of fish				Percent of total		Length range (inches) number of fish			
		Number	Weight	0–4	5–8	9–12	Over 12	Number	Weight	0–4	5–8	9–12	Over 12
I	Skipjack	1.8	3.1	14	15	.....	.....	4.2	4.3	.....	.....	.....	.....
	Goldeye	.1	3.7	.....	.....	1	1	.....	.....	.....	.....	.....	.....
	White bass	.3	1.4	1	3	1	.....	.6	1.0	.....	.....	.....	.....
	Smallmouth bass	.....	.....	.....	.....	.....	.....	.1	.4	.....	.....	.....	.....
	Spotted bass	3.2	8.5	23	27	1	.....	.8	2.8	.....	.....	.....	.....
	Largemouth bass	.4	2.6	4	2	1	.....	1.6	16.6	.....	.....	.....	.....
	White crappie	.2	.1	4	.....	.....	.....	.....	.....	.....	.....	.....	.....
		6.0	19.4	.....	.....	.....	.....	7.3	25.1	.....	.....	.....	.....
II	Silver chub	5.7	2.4	89	.....	.....	.....	3.4	.3	.....	.....	.....	.....
	Emerald shiner	43.6	5.2	683	.....	.....	.....	65.4	1.9	.....	.....	.....	.....
	River shiner	.1	<.1	2	.....	.....	.....	1.5	.1	.....	.....	.....	.....
	Spotfin shiner	.4	.2	6	.....	.....	.....	.2	<.1	.....	.....	.....	.....
	Mimic shiner	.5	<.1	8	.....	.....	.....	.....	.....	.....	.....	.....	.....
	Tadpole madtom	.2	.1	3	.....	.....	.....	.....	.....	.....	.....	.....	.....
	Rock bass	.....	.....	.....	.....	.....	.....	.1	.3	.....	.....	.....	.....
	Green sunfish	.1	.1	1	.....	.....	.....	.....	.....	.....	.....	.....	.....
	Bluegill	1.2	1.2	16	3	.....	.....	.5	.4	.....	.....	.....	.....
	Longear sunfish	1.8	2.6	28	1	.....	.....	1.3	1.0	.....	.....	.....	.....
	Logperch	.1	<.1	1	.....	.....	.....	.....	.....	.....	.....	.....	.....
		53.7	11.8	.....	.....	.....	.....	72.4	4.0	.....	.....	.....	.....

FISH POPULATION—Continued

State: Kentucky
Major basin: Ohio River
Minor basin: Ohio River—Main stem and minor tributaries
Station location: Ohio River at Louisville, Ky.

		Collecting method											
		Rotenone						Electric shocker					
Sampling date(s)		Aug. 22, 1963						Oct. 10, 1963					
Total number of fish		1,572						858					
Total weight of fish (pounds)		39.4						69.4					
Group	Species collected	Percent of total		Length range (inches) number of fish				Percent of total		Length range (inches) number of fish			
		Number	Weight	0–4	5–8	9–12	Over 12	Number	Weight	0–4	5–8	9–12	Over 12
III	Gizzard shad	29.4	53.3	242	217	3	.....	2.8	3.6	.....	.....	.....	.....
		29.4	53.3	.....	.....	.....	.....	2.8	3.6	.....	.....	.....	.....
IV	Freshwater drum	8.5	3.8	123	7	3	.....	11.1	1.9	.....	.....	.....	.....
		8.5	3.8	.....	.....	.....	.....	11.1	1.9	.....	.....	.....	.....
V	River carpsucker	.2	.4	1	2	.....	.....	.2	5.0	.....	.....	.....	.....
	Spotted sucker	1.3	8.2	4	13	4	.....	.6	4.2	.....	.....	.....	.....
		1.5	8.6	.....	.....	.....	.....	.8	9.2	.....	.....	.....	.....
VI	Carp	.....	.....	.....	.....	.....	.....	.6	26.5	.....	.....	.....	.....
	Smallmouth buffalo	.....	.....	.....	.....	.....	.....	.7	5.8	.....	.....	.....	.....
	Yellow bullhead	.1	.1	1	.....	.....	.....	.....	.....	.....	.....	.....	.....
	Channel catfish	.4	2.7	3	1	1	1	4.3	23.9	.....	.....	.....	.....
	Flathead catfish	.4	.3	6	1	.....	.....	.....	.....	.....	.....	.....	.....
		.9	3.1	.....	.....	.....	.....	5.6	56.2	.....	.....	.....	.....

OHIO RIVER AT CINCINNATI, OHIO

Samples are taken from the municipal water treatment plant intake located on the west bank of the Ohio River approximately 1/2 mile upstream from the mouth of the Little Miami River. The Corps of Engineers Markland Lock and Dam, constructed 72 miles downstream in June 1963, increased the normal pool elevation at this station by approximately 10 feet.

There are no known significant sources of municipal or industrial pollution between Cincinnati and the nearest upstream surveillance station at Huntington, West Virginia.

This section of the Ohio River supports extensive recreational use, primarily from boating and skiing, with a limited amount of sport fishing.

Plankton samples collected during July had moderate numbers of phytoplankton with an unusually large number of zooplankton. Rotifer populations ranged from 670 to 900/liter and crustaceans ranged from 125 to 435/liter. These counts indicate considerable reproduction and growth induced by a plentiful supply of organic food.

Reconnaissance samples of benthic organisms were collected on October 4, 1962. Quantitative samples were collected in the soft mud close to shore and in mid-channel sandy sediments on October 11, 1962, and on May 2 and August 8, 1963. Data collected in 1962 showed a diverse benthos with 13 species. At least five species of midge larvae were found in the soft mud near shore. The Asiatic clam (Corbicula fluminea) was dominant in the mid-river series, but only the empty shells were in the samples collected in May 1963 indicating that there was a mortality of clams during the winter of 1962-1963.

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Station Location:	Ohio River at Cincinnati, Ohio
Major Basin:	Ohio River
Minor Basin:	Ohio River - Main Stem and Minor Tributary
Station at:	39°04' Latitude 84°23' Longitude
Miles above mouth:	518
Activation Date:	April 1958
Sampled by:	Cincinnati Water Department
Field Analysis by:	Cincinnati Water Department
Other Cooperating Agencies:	Ohio State Department of Health
Hydrologic Data:	
Nearest pertinent gaging station:	At Cincinnati, Ohio
Gaging station operated by:	U.S. Geological Survey
Drainage area at gaging station:	76,580 square miles
Period of record:	1936 to present
Average discharge in record period:	96,810 cfs.
Maximum discharge in record period:	894,000 cfs.
Minimum discharge in record period:	Not Determined

Remarks: Records poor for discharges below 50,000 cfs. Flows affected by operations of navigation locks and dams.

ALKYL BENZENE SULFONATE (ABS)

Date	mg/l
3-6-63	0.07
3-13-63	0.07
3-20-63	0.06
3-27-63	0.06
4-3-63	0.05
4-10-63	0.07
4-17-63	0.06
4-24-63	0.07
5-1-63	0.07
5-8-63	0.07
5-15-63	0.07
5-23-63	0.08
5-28-63	0.08
6-5-63	0.08
6-12-63	0.06
6-19-63	0.07
6-26-63	0.09
7-2-63	0.07
7-17-63	0.08
7-24-63	0.08
7-31-63	0.10
8-7-63	0.11
8-14-63	0.09
8-21-63	0.09
8-28-63	0.09
9-4-63	0.10
9-11-63	0.09

ELEMENTAL ANALYSES

		Composite interval 10/1/62 to 12/31/62	Composite interval 4/1/63 to 6/30/63
Analysis by wet or flame methods. Results in mg/l	F	.46	.35
	Na	46	15
	K	4.3	2.6
Analysis by Spectrographic methods. Results in micrograms per liter	Zn	55	15
	Cd	*4	*2
	As	*37	*20
	B	59	43
	P	*9	*10
	Fe	44	4
	Mo	*4	*5
	Mn	1.8	2.9
	Al	–	20
	Be	*.09	*.05
	Cu	29	42
	Ag	*.7	*.5
	Ni	*4	2
	Co	*7	*2
	Pb	*9	*5
	Cr	*2	*5
	V	*4	*10
	Ba	35	26
	Sr	201	88

*Actual value is less than the amount shown. Reported result indicates limit of sensitivity at which test was performed. See text for explanation.

STRONTIUM 90 ACTIVITY

Composite Interval	pc/l	±	Composite Interval	pc/l	±
October to December	1.6	.3	April to June	–	–
January to March	–	–	July to September	3.6	.4

± at 95% Confidence Limits

SPECIFIC QUALITATIVE IDENTIFICATIONS FROM CARBON ADSORPTION EXTRACTS WATER YEAR 1962-3

Interval	Compound	Concentration* ug/l

*Concentration values, where shown, are calculated from quantitative gas chromatographic analysis of the aromatic fractions of CCE, and may be assigned the units of ug/l. In light of the unknown efficiency of carbon adsorption sampling for these compounds, the reported values represent minima, the actual values being equal to or greater than the reported values.
See page 21.

RADIOACTIVITY DETERMINATIONS

STATE OHIO

MAJOR BASIN OHIO RIVER

MINOR BASIN OHIO RIVER-MAIN STEM & MINOR TRIB.

STATION LOCATION OHIO RIVER AT CINCINNATI, OHIO

37

DATE SAMPLE TAKEN			DATE OF DETERMINATION		RADIOACTIVITY IN WATER												DATE OF DETERMINATION		RADIOACTIVITY IN PLANKTON			
					ALPHA						BETA								GROSS ACTIVITY			
					SUSPENDED		DISSOLVED		TOTAL		SUSPENDED		DISSOLVED		TOTAL				ALPHA		BETA	
MO.	DAY	YR.	MO.	DAY	pc/l	±	pc/l	±	pc/l	±	pc/l	±	pc/l	±	pc/l	±	MO.	DAY	pc/g	±	pc/g	±
10	3	62	10	23	0	1	0	1	0	1	13	10	26	17	39	20						
10	10	62	12	13	-	-	-	-	-	-	5	11	12	16	17	19						
10	17	62	12	24	-	-	-	-	-	-	6	8	10	13	16	15						
10	24	62	12	3	-	-	-	-	-	-	7	6	20	9	27	11						
10	31	62	12	26	-	-	-	-	-	-	9	8	20	11	29	14						
11	28	62	12	12*	1	1	1	1	2	1	15	7	26	8	41	11						
12	26	62	1	23*	1	1	0	1	1	1	10	7	16	8	26	11						
1	30	63	2	19*	0	1	0	1	0	1	19	8	16	8	35	12						
2	27	63	3	12*	2	1	0	1	2	1	24	6	17	7	41	9						
3	27	63	4	15*	8	4	0	1	8	4	123	10	30	4	153	11						
4	24	63	5	22*	1	1	0	1	1	1	23	7	17	7	40	10						
5	28	63	6	19*	0	1	0	1	0	1	19	6	32	8	51	10						
6	26	63	7	24*	0	0	0	1	0	1	3	6	23	8	26	10						
7	31	63	8	19*	2	1	0	0	2	1	8	3	26	4	34	5						
8	28	63	9	25*	0	0	0	1	0	1	3	5	34	15	37	16						
9	25	63	10	23*	0	1	1	1	1	1	0	22	20	9	20	24						

PLANKTON POPULATION

STATE OHIO

MAJOR BASIN OHIO RIVER

MINOR BASIN OHIO RIVER-MAIN STEM & MINOR TRIB.

STATION LOCATION OHIO RIVER AT CINCINNATI, OHIO 037

DATE OF SAMPLE			DOMINANT SPECIES OF DIATOMS AND PERCENT OF TOTAL DIATOMS (See text for Codes)									FUNGI AND SHEATHED BACTERIA (Number per ml.)	MICROINVERTEBRATES																					
			1ST		2ND		3RD		4TH				ROTIFERS												CRUSTACEA										
														GENERA AND COUNT LEVEL (See text for Codes)											GENERA AND COUNT LEVEL (See text for Codes)								
MONTH	DAY	YEAR	SPECIES	PERCENT	SPECIES	PERCENT	SPECIES	PERCENT	SPECIES	PERCENT	OTHER SPECIES PERCENT		PROTOZOA (Flagellates) Number per ml.	NUMBER PER LITER	1ST		2ND		3RD		4TH		5TH		NUMBER PER LITER	1ST		2ND		3RD		BENTHOS (Organisms/sq. ft.) Number per liter	OTHER AERIAL FORMS (Number per liter)
															GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL		GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL		
10	3	62	56	39	10	20	26	15	58	4	22		-	0											0							0	0
10	4	62											-	0											0							0	0
10	17	62	56	53	26	8	92	7	82	6	26		-	0											0							0	0
11	7	62	56	76	26	7	92	7	58	2	8		-	208	11	6	2	1	17	1					9	50	2	51	1			0	0
11	21	62	56	63	92	9	58	5	57	5	18		-	7	11	1									0							0	0
12	5	62	56	40	57	8	92	7	82	4	41	20	-	0											0							0	0
12	18	62	56	31	80	26	9	11	57	8	24	90	-	0											0							0	0
1	9	63	92	23	56	9	32	5	26	4	59		-	1											0							0	0
1	21	63	56	62	92	8	57	7	26	4	19		-	0											0							0	0
2	6	63	56	18	92	18	36	7	26	5	52		-	0											0							0	0
2	20	63	92	11	56	10	82	8	2	8	63		-	0											0							0	0
3	6	63	92	30	56	19	71	9	36	8	34		-	0											0							0	0
3	20	63											-	-											-							-	-
4	3	63	92	30	36	21	62	8	88	3	38		-	0											0							0	0
4	17	63	27	54	82	33	26	4	9	2	7		-	-											-							-	-
5	8	63	92	22	14	13	2	8	9	7	50		-	397	21	5	2	5	11	5	17	3	7	2	18	51	2	76	2			0	0
5	22	63	35	39	92	19	82	7	89	6	29		-	0											0							0	0
6	3	63	82	51	56	16	92	12	58	5	16		-	567	11	7	2	3	17	3	22	1			20	51	3	50	2			0	0
6	19	63	58	34	82	24	23	12	56	11	19		-	36	11	3									6	50	2					1	0
7	2	63	58	29	82	24	56	18	26	7	22		-	671	17	6	11	6	22	5	2	3			433	50	5	76	5			0	0
7	17	63	89	38	56	20	58	18	47	14	10		-	552	11	6	17	6	22	5					51	50	4	53	3	76	2	0	0
8	7	63	56	63	26	21	57	4	58	3	9		-	989	22	7	2	6	11	5	17	4	21	3	2							0	0
8	21	63	56	66	26	8	58	7	92	4	15		-	108	22	4	15	4	17	1	11	1	6	1	21	50	2	53	2	76	1	1	0
9	4	63	56	38	26	19	89	14	58	11	18		-	87	15	3	22	3	11	3	2	1			12	53	2	76	1			0	0
9	17	63	56	42	26	22	58	17	82	3	16		-	29	11	2	15	2							0							0	0

PLANKTON POPULATION

STATE OHIO

MAJOR BASIN OHIO RIVER

MINOR BASIN OHIO RIVER-MAIN STEM & MINOR TRIB.

STATION LOCATION OHIO RIVEF AT CINCINNATI, OHIO 37

DATE OF SAMPLE			ALGAE (Number per milliliter)									INERT DIATOM SHELLS		MOST ABUNDANT ALGAE - Genera and Count Level per ml. (See text for Code.)																	
			TOTAL	BLUE-GREEN		GREEN		FLAGELLATED (Pigmented)		DIATOMS				1ST		2ND		3RD		4TH		5TH		6TH		7TH		8TH		9TH		10TH	
MONTH	DAY	YEAR		COCCOID	FILA-MENT-OUS	COCCOID	FILA-MENT-OUS	GREEN	OTHER	CENTRIC	PENNATE	CENTRIC	PENNATE	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL
10	3	62	400	0	0	0	0	0	0	290	120	40	80																		
10	4	62	700	0	0	40	0	0	0	510	130	80	80	69	1																
10	17	62	00	0	10	0	0	0	0	10	20	0	0																		
11	7	62	400	0	0	100	0	40	0	40	170	0	80																		
11	21	62	2100	0	0	00	0	100	0	830	1120	120	80	69	3	92	2	68	1	77	1	88	1								
12	5	62	200	0	0	20	0	20	20	170	30	50	30																		
12	18	62	100	0	0	0	0	0	0	60	20	0	20																		
1	9	63	200	0	0	0	0	40	0	90	70	70	150																		
1	21	63	600	0	0	20	0	0	0	220	310	310	290	92	1																
2	6	63	200	0	0	0	0	0	0	110	70	70	260																		
2	20	63	200	0	20	0	0	0	0	80	80	30	90																		
3	6	63	300	0	20	20	0	40	0	40	190	150	630																		
3	20	63	100	0	0	0	0	0	0	40	90	70	200																		
4	3	63	300	0	0	0	0	0	0	20	290	40	370																		
4	17	63	3600	0	20	260	0	220	260	2550	290	530	0	68	4	71	3	65	1												
5	8	63	16500	150	480	1980	0	1060	0	10320	2550	4220	460	69	4	77	4	25	2	38	2	51	2	65	2	17	2	26	2	34	1	24	1
5	22	63	1700	0	20	20	0	90	0	200	1360	260	700	82	2	92	2																
6	3	63	5000	90	270	1910	0	510	0	1650	530	1210	400	71	3	24	3	69	2	92	2	15	2	65	2	38	2	26	1	16	1	25	1
6	19	63	2800	20	90	1060	0	310	0	1120	180	440	150	24	2	71	2	69	2	68	2	51	1										
7	2	63	2700	20	0	270	0	20	0	1680	700	890	60	69	3	71	2	92	1														
7	17	63	2300	0	0	100	0	20	0	730	1450	20	60	92	4	69	3																
8	7	63	5000	0	20	1600	20	20	180	2840	290	1340	40	69	4	68	3	31	1	38	1	35	1	44	1	25	1						
8	21	63	3000	0	20	1780	150	40	20	880	150	580	70	24	3	69	3	31	2	68	1	45	1										
9	4	63	1500	0	110	460	40	110	20	460	290	480	40	69	2	92	1																
9	17	63	600	0	0	250	0	70	0	270	20	400	50	69	1																		

ORGANIC CHEMICALS

RECOVERED BY CARBON FILTER TECHNIQUE

RESULTS IN MICROGRAMS PER LITER
(Parts per billion)

STATE OHIO

MAJOR BASIN OHIO RIVER

MINOR BASIN OHIO RIVER-MAIN STEM & MINOR TRIB.

STATION LOCATION OHIO RIVER AT CINCINNATI, OHIO 37

DATE OF SAMPLE BEGINNING MONTH	DAY	YEAR	END MONTH	DAY	GALLONS FILTERED	EXTRACTABLES TOTAL	CHLORO-FORM	ALCOHOL	CHLOROFORM EXTRACTABLES ETHER INSOLUBLES	WATER SOLUBLES	NEUTRALS TOTAL	ALIPHATICS	AROMATICS	OXYGEN-ATED COMPOUNDS	LOSS	WEAK ACIDS	STRONG ACIDS	BASES	LOSS
10	3	62	10	11	5334	246	120	126	2	24	53	3	4	44	2	13	10	2	16
11	7	62	11	21	2205	667	254	419	5	61	109	7	10	90	2	31	18	8	22
12	5	62	12	13	5318	257	85	172	2	20	38	5	5	28	0	8	4	2	11
1	9	63	1	17	5142	155	56	99	2	10	26	4	4	17	1	6	4	1	7
2	6	63	2	14	5029	194	135	59	7	26	62	11	11	38	2	14	7	4	15
3	6	63	3	18	6700	116	38	78	1	7	21	4	4	12	1	4	2	1	2
4	3	63	4	11	5117	110	58	52	2	14	22	6	3	11	2	5	5	1	9
5	8	03	5	16	5006	202	81	121	5	16	37	3	4	30	0	11	7	1	4
6	5	63	6	13	5337	136	48	88	1	9	21	4	3	14	0	7	4	1	5
7	2	63	7	10	5011	205	91	114	4	20	30	1	2	26	1	12	13	2	10
8	2	63	8	10	5178	271	118	153	4	27	41	1	4	35	1	14	7	2	23
9	4	63	9	12	5022	275	127	148	5	37	36	1	2	31	2	14	15	2	18

CHEMICAL, PHYSICAL AND BACTERIOLOGICAL ANALYSES

STATE OHIO

MAJOR BASIN OHIO RIVER

MINOR BASIN OHIO RIVER-MAIN STEM & MINOR TRIB.

STATION LOCATION OHIO RIVER AT CINCINNATI, OHIO

37

DATE OF SAMPLE			TEMP. (Degrees Centigrade)	DISSOLVED OXYGEN mg/l	pH	B.O.D. mg/l	C.O.D. mg/l	CHLORINE DEMAND		AMMONIA-NITROGEN mg/l	CHLORIDES mg/l	ALKALINITY mg/l	HARDNESS mg/l	COLOR (made units)	TURBIDITY (made units)	SULFATES mg/l	PHOSPHATES mg/l	TOTAL DISSOLVED SOLIDS mg/l	COLIFORMS per 100 ml.
MONTH	DAY	YEAR						1-HOUR mg/l	24-HOUR mg/l										
10	3	62	19.5	6.5	7.2	1.3	30	1.5	9.3	.8	78	42	205	7	25	177	.1	441	3500
10	10	62	20.9	5.2	7.2	.8	21	1.1	10.8	.7	85	44	212	6	15	177	.0	501	1200
10	17	62	20.2	6.7	7.1	1.7	23	1.7	4.9	.3	112	38	234	7	6	200	.1	547	700
10	24	62	17.5	7.7	7.0	1.3	22	1.0	8.1	.5	84	34	210	4	2	200	.1	480	480
10	31	62	13.5	7.8	7.0	1.8	37	.6	8.5	.8	64	38	214	7	15	165	.1	443	2600
11	7	62	11.9	8.7	7.0	1.8	29	.7	7.6	.6	75	34	215	6	5	178	.0	475	720
11	14	62	10.8	9.1	7.0	2.6	84	.8	8.8	.6	34	30	118	7	250	89	.0	260	4300
11	21	62	9.4	8.3	7.1	1.3	34	.8	6.4	.3	20	33	113	4	85	85	.1	218	4900
11	28	62	8.1	9.5	7.1	2.7	38	2.7	6.2	.2	11	28	77	7	120	56	.0	151	5700
12	5	62	7.6	10.6	7.2	1.9	26	.8	4.8	.3	14	30	90	5	10	66	.0	170	600
12	12	62	1.5	11.9	7.3	1.2	25	.7	6.8	.5	18	29	93	3	15	60	.0	191	400
12	19	62	2.1	12.8	7.5	1.7	26	.9	7.6	.6	16	39	98	7	10	62	.0	187	230
12	26	62	2.9	11.4	7.2	2.0	53	.2	7.9	.4	17	28	80	6	200	56	.0	161	33000
1	2	63	2.4	10.7	7.2	2.7	46	.2	9.1	.5	19	26	90	6	100	72	.1	191	9000
1	9	63	1.4	12.8	7.0	1.7	28	.6	6.9	.4	14	31	84	6	40	58	.0	155	2800
1	16	63	2.5	10.0	7.2	4.4	47	1.4	9.8	.5	22	38	103	6	230	61	.1	198	14000
1	23	63	1.0	12.8	7.2	2.0	26	1.0	6.9	.4	15	33	105	5	50	82	.0	200	200
1	30	63	.1	13.3	7.4	2.4	27	.2	6.2	.5	17	35	103	6	15	78	.0	193	2000
2	6	63	.4	11.9	7.3	3.6	48	.9	10.3	1.1	16	35	102	6	120	90	.0	189	2500
2	13	63	1.0	12.5	7.2	2.0	36	.9	8.9	.6	16	35	101	5	150	70	.0	177	1400
2	20	63	1.6	12.6	7.3	3.8	27	.2	7.5	.7	22	34	112	5	25	79	.0	202	400
2	27	63	.9	12.4	7.3	2.1	27	.7	6.6	.5	26	37	104	7	55	91	.0	190	2000
3	6	63	2.3	11.5	7.8	4.3	53	.6	10.8	.6	18	41	103	7	450	57	.0	186	22000
3	13	63	4.0	10.0	7.0	2.3	39	.8	8.1	.3	5	23	80	7	250	54	.0	138	9100
3	20	63	7.0	10.3	7.2	1.4	53	3.8	6.9	.3	10	26	78	7	390	46	.0	139	21000
3	27	63	6.2	10.8	6.9	1.4	68	1.9	4.7	.2	11	26	84	7	350	55	.0	153	7400
4	3	63	10.5	10.0	7.1	1.2	28	2.8	6.8	.1	10	31	86	6	40	56	.0	154	890
4	10	63	12.1	8.7	7.2	1.5	30	3.7	6.8	.2	12	40	102	6	90	64	.0	183	1500
4	17	63	12.7	10.4	7.5	1.4	40	.9	7.8	.2	17	48	120	6	9	74	.0	213	180
4	24	63	14.0	7.6	7.2	3.7	27	.8	7.8	.3	24	47	133	6	15	89	.0	248	970
5	1	63	14.1	7.6	7.2	.5	27	4.0	6.9	.4	22	48	146	5	25	110	.0	301	2000
5	8	63	7.7	11.0	7.7	2.6	23	3.2	7.7	.2	21	47	129	5	8	84	.0	247	180
5	15	63	18.2	6.9	7.3	2.0	10	.9	8.9	.2	33	54	157	8	20	101	.0	-	-
5	22	63	19.0	5.0	7.3	.4	28	4.1	7.7	.2	33	48	135	12	40	87	.0	206	4000
5	28	63	20.7	7.0	7.3	1.8	18	2.8	10.8	.3	27	49	130	9	15	88	.0	254	1400
6	5	63	21.7	6.8	7.1	1.2	13	2.9	6.0	.1	20	40	120	7	9	91	.0	274	500
6	12	63	22.2	5.9	7.3	1.0	19	3.5	7.5	.3	17	31	95	9	25	77	.0	-	1800
6	19	63	24.2	6.6	7.2	.4	12	1.9	4.2	.4	27	29	124	6	20	101	.1	287	530
6	26	63	24.7	8.9	7.7	1.3	13	1.9	6.8	.2	18	34	124	6	8	114	.0	242	150

CHEMICAL, PHYSICAL AND BACTERIOLOGICAL ANALYSES

STATE OHIO

MAJOR BASIN OHIO RIVER

MINOR BASIN OHIO RIVER-MAIN STEM & MINOR TRIB.

STATION LOCATION OHIO RIVER AT CINCINNATI, OHIO 37

DATE OF SAMPLE			TEMP. (Degrees Centigrade)	DISSOLVED OXYGEN mg/l	pH	B.O.D. mg/l	C.O.D. mg/l	CHLORINE DEMAND		AMMONIA-NITROGEN mg/l	CHLORIDES mg/l	ALKALINITY mg/l	HARDNESS mg/l	COLOR (made units)	TURBIDITY (made units)	SULFATES mg/l	PHOSPHATES mg/l	TOTAL DISSOLVED SOLIDS mg/l	COLIFORMS per 100 ml.
MONTH	DAY	YEAR						1-HOUR mg/l	24-HOUR mg/l										
7	2	63	27.3	7.3	7.6	1.4	15	2.8	5.7	.1	24	41	125	7	10	114	.0	260	370
7	10	63	25.5	6.2	7.5	.1	12	4.8	8.8	.2	26	40	110	10	7	91	.0	254	360
7	17	63	26.2	7.5	7.8	1.4	15	1.5	4.8	.0	29	51	121	5	7	96	.0	279	160
7	24	63	26.8	6.0	7.5	1.2	13	2.9	5.1	.2	31	46	121	4	5	105	.0	288	500
7	31	63	27.8	6.4	7.4	1.5	13	3.1	6.2	.3	40	48	143	3	5	109	.0	321	100
8	7	63	27.7	2.6	7.0	1.6	19	3.5	5.5	.2	46	44	149	5	7	119	.0	337	-
8	14	63	27.0	5.1	7.2	1.6	10	.8	6.4	.4	60	44	160	6	5	130	.0	438	260
8	21	63	24.2	5.6	7.2	1.0	20	2.2	4.5	.2	61	44	170	6	4	142	.0	407	100
8	28	63	25.4	5.8	7.1	1.6	17	.7	4.9	.2	52	47	155	6	2	132	.0	372	500
9	4	63	25.7	5.3	7.2	2.0	18	2.6	4.8	.1	45	46	155	8	2	135	.0	383	170
9	11	63	25.1	7.3	7.5	1.1	11	1.0	3.1	.1	34	42	119	9	6	95	.0	289	190
9	18	63	24.0	6.6	7.4	.9	16	1.3	3.4	.1	47	39	155	8	5	133	.0	380	500
9	25	63	22.2	5.4	7.5	1.0	20	1.4	3.0	.3	51	43	157	6	6	132	.0	392	30

STREAM FLOW DATA - 1962-1963

Thousand Cubic Feet per Second

PROVISIONAL--SUBJECT TO REVISION

Gaging Station at Cincinnati, Ohio
Operated by U.S. Geological Survey

STATE: Ohio

MAJOR BASIN: Ohio River

MINOR BASIN: Ohio River-Main Stem & Minor Trib.

STATION LOCATION: Ohio River at Cincinnati, Ohio

Day	October	November	December	January	February	March	April	May	June	July	August	September
1	28.700	47.800	33.500	145.000	45.000	64.400	328.000	40.200	36.800			
2	27.400	46.700	27.900	135.000	60.000	77.700	307.000	45.800	43.700			
3	28.800	48.600	26.700	103.000	84.200	117.000	270.000	44.200	38.500			
4	16.100	60.400	13.200	78.200	112.000	173.000	243.000	45.400	33.900			
5	25.100	39.800	28.400	68.400	171.000	292.000	206.000	39.200	33.800			
6	30.000	39.500	50.600	51.700	141.000	380.000	162.000	42.100	62.500			
7	25.700	29.200	52.700	51.100	125.000	435.000	138.000	30.500	93.700			
8	33.000	36.900	54.600	34.000	106.000	500.000	126.000	36.800	124.000			
9	30.100	31.100	53.200	31.100	97.800	531.000	114.000	31.800	116.000			
10	25.400	62.500	43.700	28.300	88.200	530.000	102.000	30.500	73.400			
11	28.700	110.000	35.900	52.600	83.400	499.000	88.100	30.600	58.200			
12	21.200	167.000	32.000	74.000	75.000	464.000	64.100	21.600	60.800			
13	31.200	185.000	30.800	113.000	75.100	456.000	65.200	48.600	83.500			
14	12.900	164.000	24.800	158.000	92.600	472.000	68.600	53.200	89.300			
15	18.100	133.000	17.000	184.000	92.500	469.000	58.300	28.000	79.300			
16	21.200	102.000	23.000	177.000	74.800	461.000	58.100	33.600	59.200			
17	21.600	75.000	28.400	162.000	57.700	486.000	48.700	42.600	34.300			
18	12.900	65.800	28.800	140.000	33.700	464.000	45.600	50.200	30.900			
19		76.000	24.900	119.000	41.600	490.000	39.900	64.900	21.600			
20		92.100	40.100	97.700	40.300	522.000	77.100	86.100	28.900			
21		99.500	56.000	64.800	72.600	526.000	69.500	70.200	24.700			
22		101.000			85.100	523.000	77.000	56.200	31.000			
23		116.000	150.000	64.000	85.200	513.000	87.300	49.600	41.000			
24	10.000	155.000			85.400	499.000	98.400	36.800	18.700			
25		157.000			66.900	464.000	109.000	33.500	21.800			
26		133.000	148.000		64.600	428.000	107.000	36.400				
27		106.000	111.000	50.000	45.900	393.000	93.800	36.400				
28		87.200	82.200		47.800	360.000	78.400	35.900	17.000			
29		68.000	82.100			328.000	60.800	45.400				
30		47.300	101.000	42.000		308.000	60.400	42.900				
31	34.500		123.000			294.000		59.400				

No low flow water records are available from this station after June 1963. This gage was put out of operation by backwater from a downstream reservoir.

FISH POPULATION

State: Ohio
Major basin: Ohio River
Minor basin: Ohio River—Main stem and minor tributaries
Station location: Ohio River at Cincinnati, Ohio

		Collecting method											
		Rotenone						Electric shocker					
Sampling date(s)		Sept. 19 and 20, 1963						Oct. 2, 1963					
Total number of fish		10,745						3,294					
Total weight of fish (pounds)		179.9						31.6					
Group	Species collected	Percent of total		Length range (inches) number of fish				Percent of total		Length range (inches) number of fish			
		Number	Weight	0–4	5–8	9–12	Over 12	Number	Weight	0–4	5–8	9–12	Over 12
I	Longnose gar	<0.1	0.2	.....	.....	1	3	.....	.....	.....	.....	.....	.....
	Skipjack	.2	.9	.....	20	.....	.....	0.2	3.6	.....	5	1	.....
	Smallmouth bass	.....	.....	.....	.....	.....	.....	.1	2.9	.....	1	1	.....
	Spotted bass	<.1	<.1	2	.....	.....	.....	.6	8.2	.....	12	1	.....
	Largemouth bass	.1	.4	.....	7	.....	.....	.3	11.1	.....	4	5	.....
	Black crappie	1.3	4.6	97	38	2	.....	.2	4.0	.....	5	1	.....
	White crappie	.5	2.3	44	11	3	.....	.....	.....	.....	.....	.....	.....
	Sauger	<.1	<.1	.....	1	.....	.....	.1	2.0	.....	.....	2	.....
		2.1	8.4	.....	.....	.....	.....	1.5	31.8	.....	.....	.....	.....
II	Stoneroller	.1	<.1	6	.....	.....	.....	.....	.....	.....	.....	.....	.....
	Silverjaw minnow	<.1	<.1	2	.....	.....	.....	.....	.....	.....	.....	.....	.....
	Silver chub	2.8	1.5	269	31	.....	.....	.1	.1	3	.....	.....	.....
	Emerald shiner	64.6	8.9	6,931	.....	.....	.....	87.8	31.6	2,957	.....	.....	.....
	River shiner	.5	<.1	56	.....	.....	.....	.3	.1	15	.....	.....	.....
	Common shiner	<.1	<.1	1	.....	.....	.....	.....	.....	.....	.....	.....	.....
	Spotfin shiner	5.0	.8	533	.....	.....	.....	.2	.1	12	.....	.....	.....
	Mimic shiner	4.0	.2	427	.....	.....	.....	.8	.1	35	.....	.....	.....
	Suckermouth minnow	<.1	<.1	1	.....	.....	.....	.1	.1	2	.....	.....	.....
	Bluntnose minnow	1.9	.2	206	.....	.....	.....	<.1	<.1	1	.....	.....	.....

FISH POPULATION—Continued

State: Ohio
Major basin: Ohio River
Minor basin: Ohio River—Main stem and minor tributaries
Station location: Ohio River at Cincinnati, Ohio

		Collecting method											
		Rotenone						Electric shocker					
Sampling date(s)		Sept. 19 and 20, 1963						Oct. 2, 1963					
Total number of fish		10,745						3,294					
Total weight of fish (pounds)		179.9						31.6					
Group	Species collected	Percent of total		Length range (inches) number of fish				Percent of total		Length range (inches) number of fish			
		Number	Weight	0–4	5–8	9–12	Over 12	Number	Weight	0–4	5–8	9–12	Over 12
II	Bullhead minnow	0.2	<0.1	26									
	Creek chub	<.1	<.1	2									
	Hogsucker	<.1	.1		1			0.1	0.6	1	1		
	Troutperch	<.1	<.1	2									
	Warmouth	.2	1.9	11	15								
	Green sunfish	.4	.2	44				.1	<.1	1			
	Pumpkinseed							.1	<.1	1			
	Orangespot sunfish	.8	.7	83									
	Bluegill	3.9	1.4	417	1			.1	.6	2	1		
	Longear sunfish							.1	.2	3			
	Redear sunfish	.1	.1	7	2								
	Logperch	<.1	<.1	2									
	Rainbow darter							.1	<.1	3			
		84.5	16.0					89.9	33.5				
III	Gizzard shad	5.6	20.7	17	580			2.3	23.0		105		
IV	Shorthead redhorse	<.1	<.1	2				.1	.7		1	1	
	Golden redhorse	.1	.8	3			2						
	Greater redhorse	<.1	<.1	1	1								
	Ohio redhorse							.1	.1		1		
	Freshwater drum	4.9	4.9	523		4	1	4.1	3.2	74			
		5.0	5.7					4.3	4.0				

FISH POPULATION—Continued

State: Ohio
Major basin: Ohio River
Minor basin: Ohio River—Main stem and minor tributaries
Station location: Ohio River at Cincinnati, Ohio

		Collecting method											
		Rotenone						Electric shocker					
Sampling date(s)		Sept. 19 and 20, 1963						Oct. 2, 1963					
Total number of fish		10,745						3,294					
Total weight of fish (pounds)		179.9						31.6					
Group	Species collected	Percent of total		Length range (inches) number of fish				Percent of total		Length range (inches) number of fish			
		Number	Weight	0–4	5–8	9–12	Over 12	Number	Weight	0–4	5–8	9–12	Over 12
V	River carpsucker	0.1	1.1	1	8	.....	1	.....	.....	.....	.....	.....	.....
	Quillback carpsucker	<.1	.3	1	3	.....	.....	0.1	1.1	.....	.....	1	.....
	White sucker	.1	.3	5	.....	1	.....	.....	.....	.....	.....	.....	.....
	Spotted sucker	.2	2.8	9	8	2	2	.....	.....	.....	.....	.....	.....
		.4	4.5	.....	.....	.....	.....	.1	1.1	.....	.....	.....	.....
VI	Carp	.8	19.9	58	17	8	6	.1	3.4	.....	.....	1	.....
	Smallmouth buffalo	.1	1.2	4	3	4	.....	.....	.....	.....	.....	.....	.....
	Black bullhead	.2	.5	13	7	1	.....	.....	.....	.....	.....	.....	.....
	Brown bullhead	<.1	<.1	2	.....	.....	.....	.....	.....	.....	.....	.....	.....
	Channel catfish	1.2	23.0	59	33	18	22	1.8	3.2	30	4	.....	.....
	Flathead catfish	.1	.1	7	2	.....	.....	.....	.....	.....	.....	.....	.....
		2.4	44.7	.....	.....	.....	.....	1.9	6.6	.....	.....	.....	.....

OHIO RIVER AT HUNTINGTON, WEST VIRGINIA

Samples are collected at the intake of the Huntington water treatment plant on the south bank of the Ohio River. It is approximately 38 miles below the confluence of the Kanawha and Ohio Rivers. The river in this reach is impounded by Greenup Lock and Dam located approximately 36 miles downstream.

Industrial discharges, particularly from the Charleston, West Virginia area on the Kanawha River, affect water quality at this station. The nearest significant municipal discharge is 34 miles upstream at Gallipolis, Ohio where primary treatment plant effluent with a BOD population equivalent of 3,700 is discharged.

The cities of Ironton, Ohio, Ashland, Kentucky and Huntington, West Virginia use the Ohio River as a source of water supply.

An unusually large rotifer population of 2,615 per liter was observed on June 3, 1963, together with a moderate phytoplankton count of 1,760 per milliliter. Rotifers are usually found at this station from spring to fall, but seldom exceed 300 to 400 per liter. Rotifers frequently multiply rapidly in the presence of organic matter or when certain algae are plentiful.

A high incidence of disease and parasitism was noted for fish collected during the second week in September 1963 from the Ohio River at Huntington, West Virginia. Approximately 23% of the minnows (mostly emerald shiners) collected at Huntington were parasitized by anchor worms (a parasitic copepod) and leeches, with a considerable amount of secondary fungal infection resulting from the open sores created by the parasites. Several spotted suckers, white suckers, and redhorse were also badly parasitized. Two largemouth bass had lymphocystis disease.

Reconnaissance samples of bottom organisms were taken on December 4, 1962 and routine samples were collected on May 6 and July 29, 1963. The river bottom is rocky except immediately adjacent to the Guyandotte water intake. The benthos is dominated by oligochaete worms. The Asiatic clam (Corbicula fluminea) was collected in 1962 but only empty shells were collected in May 1963, indicating a clam mortality over the winter of 1962-1963.

736-486 O - 64 - 9

Station Location:	Ohio River at Huntington, West Virginia
Major Basin:	Ohio River
Minor Basin:	Ohio River - Main Stem and Minor Tributary
Station at:	38°26' Latitude 82°26' Longitude
Miles above mouth:	677
Activation Date:	November 6, 1957
Sampled by:	Huntington Water Corporation
Field Analysis by:	Huntington Water Corporation
Other Cooperating Agencies:	West Virginia State Department of Health West Virginia Div. of Water Resources
Hydrologic Data:	
Nearest pertinent gaging station:	At Huntington, West Virginia
Gaging station operated by:	U.S. Geological Survey
Drainage area at gaging station:	55,900 square miles
Period of record:	1934 to present
Average discharge in record period:	–

Maximum discharge in record period: 376,000 cfs.

Minimum discharge in record period: –

Remarks: Discharge not determined if below 35,000 cfs. Flows affected by operations of navigation locks and dams.

ALKYL BENZENE SULFONATE (ABS)

Date	mg/l

ELEMENTAL ANALYSES

		Composite 10/1/62 to 12/31/62	Interval 4/1/63 to 6/30/63
Analysis by wet or flame methods. Results in mg/l	F	.28	.30
	Na	33	17
	K	3.9	2.6
Analysis by Spectrographic methods. Results in micrograms per liter	Zn	68	29
	Cd	*3	*2
	As	*31	*20
	B	60	60
	P	*15	*10
	Fe	22	7
	Mo	83	*5
	Mn	1.2	*2
	Al	–	35
	Be	*.08	*.05
	Cu	5	35
	Ag	*.6	*.5
	Ni	*2	*2
	Co	*6	*2
	Pb	*15	*5
	Cr	*2	*5
	V	*3	*10
	Ba	39	35
	Sr	151	90

*Actual value is less than the amount shown. Reported result indicates limit of sensitivity at which test was performed. See text for explanation.

STRONTIUM 90 ACTIVITY

Composite Interval	pc/l	±	Composite Interval	pc/l	±
October to December	1.6	.3	April to June	1.9	.3
January to March	–	–	July to September	–	–

± at 95% Confidence Limits

SPECIFIC QUALITATIVE IDENTIFICATIONS FROM CARBON ADSORPTION EXTRACTS WATER YEAR 1962-3

Interval	Compound	Concentration* ug/l

*Concentration values, where shown, are calculated from quantitative gas chromatographic analysis of the aromatic fractions of CCE, and may be assigned the units of ug/l. In light of the unknown efficiency of carbon adsorption sampling for these compounds, the reported values represent minima, the actual values being equal to or greater than the reported values.

See page 21.

RADIOACTIVITY DETERMINATIONS

STATE WEST VIRGINIA

MAJOR BASIN OHIO RIVER

MINOR BASIN OHIO RIVER-MAIN STEM & MINOR TRIB.

STATION LOCATION OHIO RIVER AT HUNTINGTON, WEST VIRGINIA 38

DATE SAMPLE TAKEN			DATE OF DETERMINATION		RADIOACTIVITY IN WATER												DATE OF DETERMINATION	RADIOACTIVITY IN PLANKTON			
					ALPHA						BETA							GROSS ACTIVITY			
					SUSPENDED		DISSOLVED		TOTAL		SUSPENDED		DISSOLVED		TOTAL			ALPHA		BETA	
MO.	DAY	YR.	MO.	DAY	pc/l	±	pc/l	±	pc/l	±	pc/l	±	pc/l	±	pc/l	±	MO. DAY	pc/g	±	pc/g	±
10	1	62	10	23	-	-	-	-	-	-	11	10	23	16	34	19					
10	8	62	12	14	0	1	1	2	1	2	4	11	25	16	29	19					
10	22	62	11	19	-	-	-	-	-	-	3	11	21	16	24	20					
10	29	62	11	15	-	-	-	-	-	-	2	10	19	14	21	17					
11	26	62	12	12*	2	2	0	1	2	2	41	10	31	9	72	13					
12	27	62	1	24*	0	1	0	1	0	1	3	6	13	8	16	10					
1	24	63	2	26*	1	1	0	1	1	1	24	9	17	8	41	12					
2	18	63	3	27*	2	1	1	1	3	1	29	8	18	8	47	13					
3	25	63	4	15*	2	4	0	2	2	4	126	10	27	4	153	11					
4	29	63	5	22*	1	1	0	1	1	1	20	14	21	8	41	16					
5	27	63	6	19*	0	0	1	1	1	1	13	6	18	8	31	10					
6	24	63	7	24*	1	1	0	0	1	1	9	6	23	9	32	11					
7	8	63	9	6*	0	1	0	0	0	1	4	6	23	8	27	10					
8	27	63	9	25*	0	0	0	1	0	1	4	6	33	16	37	17					
9	23	63	10	22*	1	1	1	2	2	2	2	3	14	10	16	10					

PLANKTON POPULATION

STATE	WEST VIRGINIA
MAJOR BASIN	OHIO RIVER
MINOR BASIN	OHIO RIVER-MAIN STEM & MINOR TRIB.
STATION LOCATION	OHIO RIVER AT
	HUNTINGTON, WEST VIRGINIA 038

DATE OF SAMPLE			DOMINANT SPECIES OF DIATOMS AND PERCENT OF TOTAL DIATOMS (See text for Codes)									FUNGI AND SHEATHED BACTERIA Number per ml.	PROTOZOA (Identifiable) (Number per ml.)	MICROINVERTEBRATES																			
			1ST		2ND		3RD		4TH					ROTIFERS											CRUSTACEA							NEMATODES (Identifiable) (Number per liter)	OTHER ANIMAL FORMS (Number per liter)
														NUMBER PER LITER	GENERA AND COUNT LEVEL (See text for Codes) 1ST		2ND		3RD		4TH		5TH		NUMBER PER LITER	GENERA AND COUNT LEVEL (See text for Codes) 1ST		2ND		3RD			
MONTH	DAY	YEAR	SPECIES	PERCENT	SPECIES	PERCENT	SPECIES	PERCENT	SPECIES	PERCENT	OTHER SPECIES PERCENT				GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL		GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL		
10	1	62	56	58	92	13	26	6	82	5	18	-	-	140	11	4	17	4	21	2	18	1			24	50	3	76	2	53	1	0	0
10	20	62	56	41	57	19	82	19	26	6	15	-	-	1320	11	7	17	7	2	5	21	4	46	4	9	76	2	50	1			0	0
11	5	62	56	86	92	5	82	2	57	2	5	20	-	12	11	1									3	50	1					0	0
11	19	62	56	59	62	14	92	9	26	4	14	-	-	0											0							0	0
12	19	62										-	-	0											0							0	0
12	27	62	92	15	56	14	57	10	26	6	55	-	-	0											0							0	0
1	7	63	80	70	82	12	57	5	26	4	9	-	-	0											0							1	1
1	28	63										-	-	0											0							0	0
2	5	63										-	-	0											0							0	0
2	18	63	92	7	2	7	56	6	57	6	74	10	-	1											0							0	0
3	4	63	92	28	56	20	36	7	62	6	39	-	-	0											0							0	0
3	18	63										-	-	0											0							0	0
4	1	63	36	31	62	15	15	6	46	3	43	-	-	-											-							-	-
4	15	63	56	33	82	12	92	12	26	5	38	-	-	51	21	3	17	2							2							0	0
5	6	63	82	35	57	20	9	11	92	10	24	-	-	388	2	5	11	5	17	4	21	4	7	1	9	76	2	50	1			2	1
5	20	63	35	39	92	15	56	10	9	8	28	-	-	278	11	6	2	3	15	1					0							3	0
6	3	63	92	29	9	20	56	16	91	13	22	-	-	2620	11	9	2	5	17	4	18	2	21	1	0							1	0
6	25	63	56	32	47	9	92	8	58	8	43	-	0	599	11	7	2	5	22	3	18	3	21	3	39	51	4	54	2	50	2	0	0
7	3	63	82	42	56	21	58	12	92	6	19	-	-	442	11	6	17	5	6	1	2	1	7	1	113	76	5	50	5	51	2	0	0
8	5	63	56	44	58	35	89	10	92	4	7	-	-	122	2	5									74	53	4	76	4			0	0
8	21	63	56	40	58	30	26	10	82	4	16	-	-	276	22	6	2	2	11	2					24	53	3	51	2	50	1	0	0
9	16	63	56	54	26	8	58	8	91	5	25	-	-	52	17	3	22	1							29	50	3	76	2	51	1	0	0

PLANKTON POPULATION

STATE WEST VIRGINIA

MAJOR BASIN OHIO RIVER

MINOR BASIN OHIO RIVER-MAIN STEM & MINOR TRIB.

STATION LOCATION OHIO RIVER AT HUNTINGTON, WEST VIRGINIA 38

DATE OF SAMPLE			ALGAE (Number per milliliter)									INERT DIATOM SHELLS		MOST ABUNDANT ALGAE - Genera and Count Level per ml. (See text for Codes)																	
			TOTAL	BLUE-GREEN		GREEN		FLAGELLATED (Pigmented)		DIATOMS				1ST		2ND		3RD		4TH		5TH		6TH		7TH		8TH		9TH		10TH	
MONTH	DAY	YEAR		COCCOID	FILAMENTOUS	COCCOID	FILAMENTOUS	GREEN	OTHER	CENTRIC	PENNATE	CENTRIC	PENNATE	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL
10	1	62	500	0	90	0	0	270	0	90	90	0	50	51	1																		
10	20	62	4300	210	0	750	0	440	100	2280	580	750	120	69	3	71	3	38	2	51	2	92	2	68	2	3	1						
11	5	62	2800	20	650	930	0	20	70	950	180	1040	450	17	3	38	2	69	2														
11	19	62	700	0	0	90	0	0	0	450	110	270	160																				
12	19	62	00	0	0	0	0	0	0	20	0	0	0																				
12	27	62	200	0	0	0	0	0	0	20	180	0	150																				
1	7	63	100	0	0	0	0	0	0	50	20	0	50																				
1	28	63	200	0	20	0	0	0	0	60	80	110	230																				
2	5	63	100	0	20	0	0	20	0	80	0	0	50																				
2	18	63	400	0	10	60	0	10	310	0	30	10	10	60	1																		
3	4	63	200	0	20	0	0	0	0	110	110	150	240																				
3	18	63	100	0	0	0	0	0	40	20	60	80	190																				
4	1	63	400	0	40	20	0	0	20	150	170	230	970																				
4	15	63	900	0	0	220	0	220	130	260	40	130	70																				
5	6	63	6400	0	40	4220	0	260	0	620	880	550	130	92	2	71	2	69	1	77	1	65	1										
5	20	63	2900	0	90	290	0	130	0	640	1780	240	460	82	3	92	2	69	2	68	1	38	1	77	1								
6	3	63	1800	0	40	460	0	530	20	200	510	180	290	65	3	38	1	92	1	77	1	51	1										
6	25	63	500	0	0	110	0	70	50	110	200	180	110																				
7	3	63	3600	0	40	970	0	200	20	1610	730	350	90	69	3	71	2	25	2	92	2	38	1	51	1								
8	5	63	1600	0	20	390	0	20	0	1080	60	350	190	69	3																		
8	21	63	400	0	0	90	0	40	70	150	40	40	0	69	1																		
9	16	63	4600	20	2750	500	20	180	0	430	700	340	110	15	5	92	2	88	1	69	1	38	1										

ORGANIC CHEMICALS

RECOVERED BY CARBON FILTER TECHNIQUE

RESULTS IN MICROGRAMS PER LITER
(Parts per billion)

STATE WEST VIRGINIA

MAJOR BASIN OHIO RIVER

MINOR BASIN OHIO RIVER-MAIN STEM & MINOR TRIB.

STATION LOCATION OHIO RIVER AT HUNTINGTON, WEST VIRGINIA 38

DATE OF SAMPLE BEGINNING MONTH	DAY	YEAR	END MONTH	DAY	GALLONS FILTERED	EXTRACTABLES TOTAL	CHLORO-FORM	ALCOHOL	CHLOROFORM EXTRACTABLES ETHER INSOLUBLES	WATER SOLUBLES	NEUTRALS TOTAL	ALIPHATICS	AROMATICS	OXYGEN-ATED COMPOUNDS	LOSS	WEAK ACIDS	STRONG ACIDS	BASES	LOSS
10	2	62	10	21	3690	531	242	289	5	58	94	2	4	88	0	27	27	7	24
11	2	62	11	20	2790	549	235	314	5	61	90	5	7	73	5	24	21	7	27
12	6	62	1	2	3615#	402	193	209	10	39	85	3	8	71	3	16	12	6	25
2	14	63	3	3	2662	403	221	182	11	46	93	7	10	68	8	16	13	4	38
3	25	63	4	18	3562	249	107	142	4	23	36	6	5	22	3	12	13	1	18
5	6	63	5	28	4613	292	157	135	9	35	52	1	4	44	3	19	15	3	24
6	12	63	7	8	3563	275	119	156	7	30	39	3	3	32	1	15	12	3	13
8	2	63	9	3	6652	270	145	125	5	33	48	1	2	42	3	16	19	4	20

ESTIMATED

CHEMICAL, PHYSICAL AND BACTERIOLOGICAL ANALYSES

STATE WEST VIRGINIA

MAJOR BASIN OHIO RIVER

MINOR BASIN OHIO RIVER-MAIN STEM & MINOR TRIB.

STATION LOCATION OHIO RIVER AT HUNTINGTON, WEST VIRGINIA 38

DATE OF SAMPLE			TEMP. (Degrees Centigrade)	DISSOLVED OXYGEN mg/l	pH	B.O.D. mg/l	C.O.D. mg/l	CHLORINE DEMAND		AMMONIA-NITROGEN mg/l	CHLORIDES mg/l	ALKALINITY mg/l	HARDNESS mg/l	COLOR (Pt-Co units)	TURBIDITY (Jackson units)	SULFATES mg/l	PHOSPHATES mg/l	TOTAL DISSOLVED SOLIDS mg/l	COLIFORMS per 100 ml.
MONTH	DAY	YEAR						1-HOUR mg/l	24-HOUR mg/l										
10	1	62	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	150
10	3	62	21.0	2.2	6.9	-	-	-	-	1.0	83	37	236	7	16	226	-	580	-
10	10	62	21.6	2.6	6.7	-	-	-	-	.8	76	32	200	5	17	283	-	-	-
10	17	62	22.4	2.8	6.8	-	-	-	-	.9	79	31	204	5	15	296	-	-	-
10	22	62	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	500
10	24	62	16.6	8.0	6.8	-	-	-	-	-	90	23	232	10	14	-	-	220	-
10	29	62	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	640
10	31	62	16.0	2.8	6.8	-	-	-	-	.8	55	29	196	5	20	194	-	520	-
11	5	62	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	690
11	7	62	12.0	10.2	6.9	-	-	-	-	1.1	48	30	184	7	21	221	-	460	-
11	12	62	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	11000
11	14	62	12.8	9.8	6.9	-	-	-	-	.8	19	32	-	15	200	96	-	220	-
11	19	62	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1600
11	21	62	12.8	10.2	6.9	-	-	-	-	.8	21	30	115	10	75	125	-	360	-
11	26	62	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1800
11	28	62	7.7	11.3	6.9	-	-	-	-	.8	13	22	92	12	68	96	-	180	-
12	5	62	7.8	10.4	7.0	-	-	-	-	.9	15	21	100	10	26	-	-	160	-
12	12	62	3.2	10.0	7.0	-	-	-	-	.7	15	36	98	15	25	110	-	240	-
12	19	62	4.2	12.1	6.9	-	-	-	-	.7	12	32	118	15	27	-	-	180	-
12	26	62	4.4	4.6	7.0	-	-	-	-	.8	17	25	114	20	105	-	-	160	-
1	1	63	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2600
1	2	63	.5	4.8	7.0	-	-	-	-	.6	14	26	88	15	175	82	-	280	-
1	7	63	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	580
1	9	63	3.0	4.2	7.0	-	-	-	-	.7	21	30	110	10	36	-	-	200	-
1	16	63	4.0	-	6.9	-	-	-	-	.8	16	33	108	20	170	-	-	200	-
1	23	63	3.8	-	6.9	-	-	-	-	.7	19	24	114	15	43	-	-	130	-
1	30	63	3.0	-	6.9	-	-	-	-	.6	16	31	118	10	23	-	-	120	-
2	6	63	2.5	-	6.9	-	-	-	-	1.0	18	28	102	20	170	77	-	200	-
2	11	63	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4000
2	13	63	2.1	-	6.9	-	-	-	-	.7	24	31	116	15	30	101	-	240	-
2	18	63	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	160
2	20	63	2.2	-	6.9	-	-	-	-	.5	21	28	108	10	34	96	-	210	-
2	25	63	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	100
2	27	63	2.6	-	6.9	-	-	-	-	.6	19	29	100	10	35	91	-	250	-
3	4	63	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	900
3	6	63	3.3	4.3	6.9	-	-	-	-	.5	15	39	100	37	1100	-	-	180	-
3	11	63	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	420
3	13	63	6.6	7.0	6.6	-	-	-	-	.5	12	28	80	40	800	72	-	180	-
3	18	63	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1500

CHEMICAL, PHYSICAL AND BACTERIOLOGICAL ANALYSES

STATE WEST VIRGINIA
MAJOR BASIN OHIO RIVER
MINOR BASIN OHIO RIVER-MAIN STEM & MINOR TRIB.
STATION LOCATION OHIO RIVER AT
HUNTINGTON, WEST VIRGINIA 38

DATE OF SAMPLE			TEMP. (Degrees Centigrade)	DISSOLVED OXYGEN mg/l	pH	B.O.D. mg/l	C.O.D. mg/l	CHLORINE DEMAND		AMMONIA-NITROGEN mg/l	CHLORIDES mg/l	ALKALINITY mg/l	HARDNESS mg/l	COLOR (scale units)	TURBIDITY (scale units)	SULFATES mg/l	PHOSPHATES mg/l	TOTAL DISSOLVED SOLIDS mg/l	COLIFORMS per 100 ml.
MONTH	DAY	YEAR						1-HOUR mg/l	24-HOUR mg/l										
3	20	63	7.8	4.5	6.8	-	-	-	-	.3	12	25	84	20	250	-	-	140	-
3	25	63	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2700
3	27	63	8.5	4.2	6.8	-	-	-	-	.4	12	28	76	15	170	-	-	130	-
4	1	63	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1900
4	3	63	11.5	13.0	6.8	-	-	-	-	.5	15	28	38	15	175	-	-	200	-
4	8	63	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	50
4	10	63	11.9	6.2	7.3	-	-	-	-	.4	13	35	114	5	90	-	-	190	-
4	15	63	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	*10
4	17	63	12.2	6.0	7.0	-	-	-	-	.4	19	38	122	10	25	-	-	220	-
4	22	63	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	*10
4	24	63	15.0	5.2	7.3	-	-	-	-	.5	25	40	174	5	65	149	-	280	-
5	1	63	15.6	-	6.9	-	-	-	-	.6	29	42	126	5	25	158	-	320	-
5	6	63	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	*10
5	8	63	15.0	6.5	6.9	-	-	-	-	.5	29	35	130	10	15	106	-	300	-
5	15	63	18.0	9.0	7.0	-	-	-	-	.5	25	38	144	5	30	144	-	300	-
5	22	63	18.4	5.0	6.9	-	-	-	-	.7	27	41	140	10	70	115	-	-	-
5	27	63	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	50
5	29	63	19.2	6.0	7.0	-	-	-	-	.4	23	30	148	15	40	-	-	200	-
6	3	63	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	360
6	5	63	22.0	.4	7.0	-	-	-	-	.5	33	32	150	10	28	187	-	320	-
6	10	63	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	*10
6	12	63	21.1	5.0	7.2	-	-	-	-	.2	29	35	142	10	70	120	-	310	-
6	19	63	22.4	5.2	6.9	-	-	-	-	.3	28	22	118	10	50	-	-	260	-
6	26	63	23.5	5.9	7.0	-	-	-	-	.3	25	25	120	5	30	125	-	-	-
7	3	63	25.6	4.0	7.2	-	-	-	-	.4	24	36	134	10	32	-	-	180	-
7	10	63	26.4	5.0	7.0	-	-	-	-	.5	34	38	144	10	30	-	-	-	-
7	17	63	27.0	4.0	6.9	-	-	-	-	.5	36	39	162	5	18	-	-	240	-
7	24	63	28.0	4.0	6.9	-	-	-	-	.4	39	38	148	10	35	146	-	280	-
7	31	63	27.6	4.0	7.0	-	-	-	-	.4	38	40	172	5	20	144	-	280	-
8	3	63	-	-	-	1.2	28	-	-	-	-	-	-	-	-	-	.1	-	-
8	15	63	-	-	-	1.0	26	-	-	-	-	-	-	-	-	-	.1	-	-
8	22	63	-	-	-	.4	33	-	-	-	-	-	-	-	-	-	.0	-	-
8	30	63	-	3.5	-	.8	44	-	-	-	-	-	-	-	-	-	.0	-	-
9	5	63	-	3.5	-	.4	60	-	-	-	-	-	-	-	-	-	.0	-	-
9	10	63	-	1.4	-	.9	20	-	-	-	-	-	-	-	-	-	.0	-	-
9	26	63	-	2.7	-	1.1	18	-	-	-	-	-	-	-	-	-	-	-	-

STREAM FLOW DATA - 1962-1963

Thousand Cubic Feet per Second

PROVISIONAL--SUBJECT TO REVISION

Gaging Station at Huntington, West Virginia
Operated by U.S. Geological Survey

STATE	West Virginia
MAJOR BASIN	Ohio River
MINOR BASIN	Ohio River-Main Stem & Minor Trib.
STATION LOCATION	Ohio River at Huntington, West Virginia

Day	October	November	December	January	February	March	April	May	June	July	August	September
1	19.500	47.900	32.600	100.000	28.400	43.400	209.000	41.300	29.800	19.700	11.400	7.750
2	17.400	46.300	27.400	66.300	32.600	107.000	190.000	52.600	28.800	23.300	11.600	9.660
3	17.200	45.600	20.000	62.500	74.400	140.000	168.000	49.200	19.200	21.500	11.400	16.000
4	17.500	31.000	21.000	56.000	110.000	148.000	150.000	45.400	19.200	31.400	46.300	13.500
5	19.400	26.300	30.000	47.100	113.000	229.000	131.000	39.100	68.200	21.400	29.600	11.600
6	21.700	23.400	44.000	35.800	85.500	372.000	119.000	33.900	121.000	15.500	43.400	13.600
7	21.700	19.500	60.000	33.700	87.300	440.000	109.000	30.000	133.000	15.700	28.100	11.400
8	22.000	19.600	55.000	31.800	74.300	468.000	103.000	32.300	101.000	15.500	15.100	13.300
9	19.300	21.800	45.000	29.300	76.700	403.000	88.100	30.100	61.400	9.000	9.220	11.500
10	13.500	102.000	32.000	33.100	64.700	334.000	62.200	29.900	70.500	11.000	11.400	11.400
11	19.700	151.000	30.000	56.600	55.500	305.000	46.700	27.400	73.700	12.000	11.300	11.500
12	15.100	151.000	30.000	115.000	74.200	301.000	54.200	23.300	95.300	14.000	16.200	15.400
13	15.600	125.000	29.000	162.000	84.400	321.000	47.400	28.400	100.000	10.000	13.200	13.700
14	11.400	106.000	22.000	181.000	71.700	325.000	34.800	23.700	87.300	12.000	9.340	5.970
15	11.600	67.800	18.000	163.000	56.500	275.000	34.200	23.800	40.000	10.000	11.500	9.400
16	17.600	51.400	18.000	137.000	37.600	273.000	30.400	25.600	31.800	8.600	9.530	7.750
17	15.300	57.200	19.700	117.000	31.900	286.000	34.600	28.400	31.400	9.000	13.900	9.840
18	11.300	61.400	23.900	102.000	28.800	300.000	31.100	52.100	27.000	15.400	7.680	9.980
19	17.500	70.600	29.600	73.500	35.900	350.000	35.800	60.800	23.400	11.500	24.200	9.670
20	17.400	87.100	55.400	51.400	61.300	400.000	63.000	49.000	25.900	15.600	9.720	9.650
21	15.600	83.800	90.700	56.700	67.300	430.000	78.300	45.200	23.500	15.400	7.700	11.600
22	11.400	108.000	134.000	54.000	77.100	440.000	82.200	46.300	19.300	17.200	7.620	11.600
23	15.600	148.000	142.000	56.000	60.200	420.000	96.100	41.200	21.800	17.900	14.000	7.660
24	15.800	130.000	127.000	58.000	48.800	380.000	99.700	28.000	19.200	13.300	7.860	9.600
25	16.000	103.000	104.000	39.000	45.100	332.000	97.400	30.400	15.300	13.000	11.800	7.680
26	12.000	57.000	75.000	33.000	41.100	314.000	83.600	28.400	15.400	15.600	9.740	7.630
27	12.200	65.800	61.900	32.000	31.200	280.000	63.400	19.200	13.300	15.600	7.700	7.490
28	16.400	53.600	71.600	37.000	38.800	268.000	53.000	21.200	19.500	19.000	12.000	7.420
29	12.100	37.600	71.200	35.000		263.000	47.700	26.300	20.000	13.600	9.670	7.420
30	12.200	33.600	114.000	32.800		260.000	40.400	33.700	15.300	13.900	11.700	5.870
31	29.600		131.000	36.000		235.000		25.600		11.400	9.910	

FISH POPULATION

State: Ohio
Major basin: Ohio River
Minor basin: Ohio River—Main stem and minor tributaries
Station location: Ohio River at Huntington, W. Va.

		Collecting method											
		Rotenone						Electric shocker					
Sampling date(s)		Sept. 10, 1963						Sept. 11, 1963					
Total number of fish		1,312						1,293					
Total weight of fish (pounds)		53.4						20.4					
Group	Species collected	Percent of total		Length range (inches) number of fish				Percent of total		Length range (inches) number of fish			
		Number	Weight	0–4	5–8	9–12	Over 12	Number	Weight	0–4	5–8	9–12	Over 12
I	Skipjack	0.3	0.5	1	3	.....	.....	0.1	0.3	.....	1	.....	.....
	Smallmouth bass	.1	.4	1	.....	.....	.....	.2	1.1	.....	3	.....	.....
	Spotted bass	.1	.1	.....	1	.....	.....	.2	5.2	.....	2	1	.....
	Largemouth bass	.4	2.5	.....	3	2	.....	.3	5.4	.....	3	1	.....
	Black crappie	1.7	4.2	13	8	1	.....	.2	3.2	.....	1	1	.....
		2.6	7.7	.....	.....	.....	.....	1.0	15.2	.....	.....	.....	.....
II	Stoneroller	.2	<.1	2	.....	.....	.....	.2	.2	2	.....	.....	.....
	Silver chub	.5	.1	7	.....	.....	.....	.....	.....	.....	.....	.....	.....
	Golden shiner	.2	.1	2	.....	.....	.....	.....	.....	.....	.....	.....	.....
	Emerald shiner	4.7	.4	62	.....	.....	.....	53.8	10.8	699	.....	.....	.....
	River shiner	1.4	.1	19	.....	.....	.....	.2	<.1	3	.....	.....	.....
	Common shiner	10.8	2.3	140	.....	.....	.....	.5	.7	6	.....	.....	.....
	Spotfin shiner	4.3	.2	57	.....	.....	.....	3.4	.3	44	.....	.....	.....
	Sand shiner	5.4	.4	71	.....	.....	.....	.3	.1	4	.....	.....	.....
	Mimic shiner	.6	<.1	8	.....	.....	.....	6.6	1.2	85	.....	.....	.....
	Steelcolor shiner	.2	<.1	2	.....	.....	.....	.1	<.1	1	.....	.....	.....
	Bluntnose minnow	11.4	.7	151	.....	.....	.....	1.8	.4	23	.....	.....	.....
	Brindled madtom	.2	<.1	2	.....	.....	.....	.....	.....	.....	.....	.....	.....
	Rock bass	.....	.....	.....	.....	.....	.....	.3	3.3	.....	4	.....	.....

FISH POPULATION—Continued

State: Ohio
Major basin: Ohio River
Minor basin: Ohio River—Main stem and minor tributaries
Station location: Ohio River at Huntington, W. Va.

		Collecting method											
		Rotenone						Electric shocker					
Sampling date(s)		Sept. 10, 1963						Sept. 11, 1963					
Total number of fish		1,312						1,293					
Total weight of fish (pounds)		53.4						20.4					
Group	Species collected	Percent of total		Length range (inches) number of fish				Percent of total		Length range (inches) number of fish			
		Number	Weight	0–4	5–8	9–12	Over 12	Number	Weight	0–4	5–8	9–12	Over 12
II	Warmouth	1.1	0.2	15	.....	.....	.....	.....	.....	.....	.....	.....	.....
	Green sunfish	.2	<.1	3	.....	.....	.....	.....	.....	.....	.....	.....	.....
	Orangespot sunfish	3.4	.8	45	.....	.....	.....	.....	.....	.....	.....	.....	.....
	Bluegill	6.7	2.8	83	5	.....	.....	1.8	5.3	19	4	.....	.....
	Longear sunfish	.3	.4	3	1	.....	.....	6.3	10.6	77	5	.....	.....
	Redear sunfish	5.0	1.6	64	.....	.....	.....	.2	.3	3	.....	.....	.....
	Johnny darter	.1	<.1	1	.....	.....	.....	.....	.....	.....	.....	.....	.....
	Logperch	.1	<.1	1	.....	.....	.....	.....	.....	.....	.....	.....	.....
		56.8	10.1	.....	.....	.....	.....	75.5	33.2	.....	.....	.....	.....
III	Gizzard shad	19.6	34.9	6	239	14	.....	4.2	14.6	.....	55	.....	.....
IV	Shorthead redhorse	.1	.2	.....	1	.....	.....	.2	1.0	.....	2	.....	.....
	Golden redhorse	.3	4.2	.....	2	.....	1	.....	.....	.....	.....	.....	.....
	Ohio redhorse	.3	.8	.....	3	1	.....	.1	.1	.....	1	.....	.....
	Freshwater drum	.4	1.2	4	.....	1	.....	2.2	2.3	28	.....	.....	.....
		1.1	6.4	.....	.....	.....	.....	2.5	3.4	.....	.....	.....	.....

FISH POPULATION—Continued

State: Ohio
Major basin: Ohio River
Minor basin: Ohio River—Main stem and minor tributaries
Station location: Ohio River at Huntington, W. Va.

		Collecting method											
		Rotenone						Electric Shocker					
Sampling date(s)		Sept. 10, 1963						Sept. 11, 1963					
Total number of fish		1,312						1,293					
Total weight of fish (pounds)		53.4						20.4					
Group	Species collected	Percent of total		Length range (inches) number of fish				Percent of total		Length range (inches) number of fish			
		Number	Weight	0–4	5–8	9–12	Over 12	Number	Weight	0–4	5–8	9–12	Over 12
V	White sucker	0.3	0.7	.....	4	.....	.....	.....	.....	.....	.....	.....	.....
	Spotted sucker	.3	2.1	.....	1	1	1	.....	.....	.....	.....	.....	.....
		.6	2.8	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
VI	Carp	.....	.....	.....	.....	.....	.....	.4	4.9	.....	5	.....	.....
	Goldfish	.....	.....	.....	.....	.....	.....	.1	2.2	.....	.....	1	.....
	Smallmouth buffalo	.....	.....	.....	.....	.....	.....	.1	1.6	.....	.....	1	.....
	Black bullhead	7.1	2.3	90	3	.....	.....	.....	.....	.....	.....	.....	.....
	Yellow bullhead	.2	<.1	2	.....	.....	.....	.1	2.4	.....	.....	1	.....
	Brown bullhead	.5	4.8	.....	3	4	.....	.1	1.9	.....	1	.....	.....
	Channel catfish	11.4	31.0	22	119	4	4	15.8	20.5	185	17	1	1
	Flathead catfish	.1	<.1	1	.....	.....	.....	.2	.1	2	.....	.....	.....
		19.3	38.1	.....	.....	.....	.....	16.8	33.6	.....	.....	.....	.....

OHIO RIVER BELOW ADDISON, OHIO

This sampling point is at the intake of the Kyger Creek station of the Ohio Valley Electric Corporation, approximately four miles upstream from the mouth of the Kanawha River, and 18 miles above Gallipolis Lock and Dam.

There is a complex of chemical, steel, pharmaceutical and other industries upstream from this station and below the Surveillance System station at Toronto, Ohio. Most of these industries are in the Wheeling, Moundsville and Parkersburg, West Virginia areas at distances of 80 to 170 miles upstream from the sampling point.

On the basis of exploratory bottom fauna sampling during 1963, this is the furthest upstream station at which the Asiatic clam, Corbicula fluminea, has been found.

Station Location: Ohio River below Addison, Ohio

Major Basin: Ohio River

Minor Basin: Ohio River - Main Stem and Minor Tributary

Station at: 38°55' Latitude 82°08' Longitude

Miles above mouth: 260

Activation Date: June 4, 1962

Sampled by: Ohio Valley Electric Corporation

Field Analysis by: Ohio Valley Electric Corporation
U.S. Public Health Service

Other Cooperating Agencies: Ohio Department of Health

Hydrologic Data:

Nearest pertinent gaging station: At Pomeroy, Ohio

Gaging station operated by: U.S. Geological Survey

Drainage area at gaging station: 40,500 square miles

Period of record: 1936-1937; 1940 to present

Average discharge in record period: Not determined

Maximum discharge in record period: 554,000 cfs.

Minimum discharge in record period: Not determined

Remarks: Flows regulated by operations of navigation locks and dams. Discharges below 35,000 cfs are not determined.

ALKYL BENZENE SULFONATE (ABS)

Date	mg/l
3-6-63	0.07
3-13-63	0.08
3-18-63	0.07
3-25-63	0.05
4-8-63	0.06
4-15-63	0.06
4-22-63	0.06
4-29-63	0.05
5-6-63	0.06
5-13-63	0.06
5-20-63	0.07
5-27-63	0.08
6-3-63	0.08
6-17-63	0.06
6-24-63	0.08
7-1-63	0.07
7-8-63	0.07
7-22-63	0.12
7-29-63	0.12
8-12-63	0.11
8-19-63	0.12
8-26-63	0.11
9-3-63	0.12
9-9-63	0.12
9-23-63	0.13
9-30-63	0.17

ELEMENTAL ANALYSES

		Composite Interval 10/1/62 to 12/31/62	Composite Interval 4/1/63 to 6/30/63
Analysis by wet or flame methods. Results in mg/l	F	.40	.30
	Na	38	18
	K	4.5	2.9
Analysis by Spectrographic methods. Results in micrograms per liter	Zn	28	8
	Cd	*3	*3
	As	*25	*30
	B	64	35
	P	*13	*15
	Fe	113	*6
	Mo	14	*8
	Mn	.9	*3
	Al	—	*6
	Be	*.06	*.08
	Cu	3	6
	Ag	*.5	*.8
	Ni	*1	*3
	Co	*5	*3
	Pb	*13	*8
	Cr	*1	*8
	V	*3	*15
	Ba	20	51
	Sr	121	90

*Actual value is less than the amount shown. Reported result indicates limit of sensitivity at which test was performed. See text for explanation.

STRONTIUM 90 ACTIVITY

Composite Interval	pc/l	±	Composite Interval	pc/l	±
October to December	2.1	.3	April to June	—	—
January to March	—	—	July to September	4.0	.5

± at 95% Confidence Limits

SPECIFIC QUALITATIVE IDENTIFICATIONS FROM CARBON ADSORPTION EXTRACTS WATER YEAR 1962-3

Interval	Compound	Concentration* ug/l

*Concentration values, where shown, are calculated from quantitative gas chromatographic analysis of the aromatic fractions of CCE, and may be assigned the units of ug/l. In light of the unknown efficiency of carbon adsorption sampling for these compounds, the reported values represent minima, the actual values being equal to or greater than the reported values.
See page 21.

RADIOACTIVITY DETERMINATIONS

STATE OHIO

MAJOR BASIN OHIO RIVER

MINOR BASIN OHIO RIVER MAIN STEM & MINOR TRIB.

STATION LOCATION OHIO RIVER BELOW
ADDISON, OHIO 117

DATE SAMPLE TAKEN			RADIOACTIVITY IN WATER														RADIOACTIVITY IN PLANKTON				
			DATE OF DETERMINATION	ALPHA					BETA								DATE OF DETERMINATION	GROSS ACTIVITY			
				SUSPENDED		DISSOLVED		TOTAL	SUSPENDED		DISSOLVED		TOTAL					ALPHA		BETA	
MO.	DAY	YR.	MO. DAY	pc/l	±	pc/l	±	pc/l ±	pc/l	±	pc/l	±	pc/l	±			MO. DAY	pc/g	±	pc/g	±
10	1	62	10 29	1	1	0	3	1 3	10	10	54	17	64	20							
10	8	62	11 1	0	1	0	1	0 1	8	11	16	14	24	18							
10	15	62	11 7	0	1	0	1	0 1	28	11	15	17	43	20							
10	22	62	11 20	0	1	0	1	0 1	13	11	30	16	43	19							
10	29	62	11 16	0	1	0	1	0 1	4	11	26	16	30	1							
11	5	62	12 19	0	1	1	2	1 2	0	18	22	14	22	23							
11	12	62	12 3	1	1	0	1	1 1	42	7	40	8	82	11							
11	19	62	12 17	0	0	1	1	1 1	6	5	31	8	37	9							
11	26	62	12 19	1	1	0	0	1 1	12	6	27	7	39	9							
12	3	62	12 28	0	1	0	1	0 1	12	6	20	8	32	10							
12	10	62	1 3	0	0	0	1	0 1	6	6	22	8	28	10							
12	17	62	1 9	0	1	0	0	0 1	3	6	51	10	54	12							
12	26	62	1 16	0	0	0	1	0 1	8	6	22	8	30	10							
12	31	62	1 15	1	1	0	1	1 1	26	7	19	9	45	11							
1	8	63	1 23	0	0	1	1	1 1	2	6	23	9	25	11							
1	14	63	1 25	0	1	3	2	3 2	74	16	31	8	105	18							
1	21	63	2 1	0	1	0	1	0 1	9	7	18	7	27	10							
1	28	63	2 11	0	0	0	0	0 0	4	3	24	4	28	4							
2	4	63	2 19	0	1	0	1	0 1	16	7	25	9	41	11							
2	11	63	3 4	0	1	0	0	0 1	12	3	23	4	35	5							
2	18	63	3 7	0	0	0	0	0 0	10	6	20	9	30	11							
2	25	63	4 5	1	1	1	1	2 1	24	6	26	7	50	9							
3	4	63	3 22	4	2	0	1	4 2	84	10	110	10	194	14							
3	11	63	3 25	7	6	1	1	8 6	134	13	30	4	164	14							
3	18	63	4 4	4	4	0	1	4 4	80	36	29	8	109	37							
3	25	63	4 8	3	2	0	1	3 2	60	5	32	4	92	6							
4	29	63	6 3*	0	1	0	0	0 1	11	3	22	4	33	5							
5	27	63	6 25*	0	0	0	1	0 1	2	6	19	8	21	10							
6	24	63	8 6*	0	0	0	0	0 0	4	6	25	9	29	11							
7	29	63	9 9*	0	0	0	0	0 0	3	3	21	4	24	5							
8	26	63	10 14*	0	0	0	1	0 1	2	3	25	9	27	9							
9	30	63	11 20*	0	1	0	1	0 1	5	8	32	12	37	14							

PLANKTON POPULATION

STATE OHIO
MAJOR BASIN OHIO RIVER
MINOR BASIN OHIO RIVER MAIN STEM & MINOR TRIB.
STATION LOCATION OHIO RIVER BELOW
ADDISON, OHIO 117

DATE OF SAMPLE			DOMINANT SPECIES OF DIATOMS AND PERCENT OF TOTAL DIATOMS (See text for Codes)									FUNGI AND SHEATHED BACTERIA Number per ml.	MICROINVERTEBRATES																					
			1ST		2ND		3RD		4TH				PROTOZOA (Flagellates) Number per ml.	ROTIFERS												CRUSTACEA									
															GENERA AND COUNT LEVEL (See text for Codes)																				
														NUMBER PER LITER	1ST		2ND		3RD		4TH		5TH		NUMBER PER LITER	1ST		2ND		3RD		REMAINING (Flagellates) Number per liter	OTHER ANIMAL FORMS (Number per liter)
MONTH	DAY	YEAR	SPECIES	PERCENT	SPECIES	PERCENT	SPECIES	PERCENT	SPECIES	PERCENT	OTHER SPECIES PERCENT				GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL		GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL		
10	1	62	56	42	89	26	26	9	92	7	16		-	-	733	11	7	2	4	22	3	17	3	21	2	36	50	3	76	2	51	2	0	0
10	15	62	56	41	57	40	26	6	92	4	9		-	-	929	11	7	17	6	2	5	21	3	22	2	20	50	3	76	1			0	0
11	5	62	56	68	57	19	92	3	26	2	8		-	-	51	11	3	21	1	20	1					18	50	3	76	1			0	0
11	19	62	57	37	56	36	92	5	26	4	18		-	-	2											0							0	0
12	3	62	57	39	56	16	26	11	92	5	29	60	0	-	1											0							0	0
12	17	62	82	18	57	15	26	11	56	9	47		-	-	0											0							0	0
1	8	63											-	-	0											0							0	0
1	21	63	56	29	82	16	92	10	57	9	36		-	-	0											0							0	0
2	4	63	82	57	26	6	57	5	63	2	30		-	-	0											0							0	0
2	18	63											-	-	0											0							0	0
3	4	63	92	44	62	7	36	6	71	6	37		-	-	0											0							0	0
3	18	63											-	-	-											-							-	-
4	1	63	36	19	92	19	62	12	26	3	45		-	-	0											0							0	0
4	15	63	27	32	82	15	9	6	26	5	42		-	-	3											0							0	0
5	6	63	89	31	82	24	57	12	9	8	25		-	-	-											-							-	-
5	20	63	35	65	57	11	92	11	91	3	10		-	-	-											-							-	-
6	3	63	92	55	91	30	9	3	56	2	10		-	-	-											-							-	-
6	17	63	26	35	9	8	56	7	92	7	43		-	-	-											-							-	-
7	1	63	56	31	27	21	58	14	57	7	27		-	-	-											-							-	-
7	15	63	82	21	58	16	57	15	56	13	35		-	-	-											-							-	-
8	5	63	56	68	58	10	26	5	92	4	13		-	-	-											-							-	-
8	19	63	56	91	89	3	26	2			4		-	-	-											-							-	-
9	3	63	56	67	58	13	89	8	26	4	8		-	-	-											-							-	-
9	16	63	56	52	27	16	58	6	92	6	20		-	-	-											-							-	-

PLANKTON POPULATION

STATE OHIO

MAJOR BASIN OHIO RIVER

MINOR BASIN OHIO RIVER MAIN STEM & MINOR TRIB.

STATION LOCATION OHIO RIVER BELOW ADDISON, OHIO 117

DATE OF SAMPLE			ALGAE (Number per milliliter)									INERT DIATOM SHELLS		MOST ABUNDANT ALGAE - Genera and Count Level per ml. (See text for Codes)															
			TOTAL	BLUE-GREEN		GREEN		FLAGELLATED (Pigmented)		DIATOMS				1ST		2ND		3RD		4TH		5TH		6TH		7TH		8TH		9TH		10TH	
MONTH	DAY	YEAR		COCCOID	FILAMENTOUS	COCCOID	FILAMENTOUS	GREEN	OTHER	CENTRIC	PENNATE	CENTRIC	PENNATE	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL
10	1	62	3100	50	50	630	0	320	50	1400	590	230	50	92	6	68	3	69	3	57	1	38	1										
10	15	62	14700	540	460	4180	40	910	250	6420	1860	1200	540	69	6	92	4	68	3	40	3	36	3	25	3	51	3	41	3	16	2	71	2
11	5	62	5000	120	230	1590	0	170	80	2150	620	120	40	69	4	38	3	25	2	92	2												
11	19	62	600	0	60	50	0	80	0	380	80	180	140	69	2																		
12	3	62	200	0	110	20	0	0	20	50	60	120	20																				
12	17	62	800	0	70	60	0	330	0	210	80	120	0	51	2																		
1	8	63	00	0	0	0	0	0	0	30	0	20	20																				
1	21	63	600	0	0	40	0	0	0	190	340	40	0	92	1																		
2	4	63	100	0	0	0	0	30	0	20	50	30	20																				
2	18	63	100	0	0	20	0	0	50	20	20	0	30																				
3	4	63	400	0	0	0	0	0	130	70	180	20	440																				
3	18	63	300	0	20	0	0	0	0	110	190	20	320																				
4	1	63	900	0	0	0	0	0	210	40	670	270	1070	65	1	92	1	82	1														
4	15	63	900	40	0	110	0	200	0	440	150	130	40	68	1																		
5	6	63	1200	20	20	70	0	130	0	530	440	20	20	92	2	69	1	71	1														
5	20	63	3300	0	110	400	0	40	0	840	1960	150	240	82	4	69	2	92	2	24	1	68	1										
6	3	63	6600	0	170	2390	0	920	0	920	2200	1360	290	38	4	65	3	68	2	71	1	92	1	25	1	34	1	17	1				
6	17	63	800	0	150	320	0	0	0	130	190	80	60																				
7	1	63	3800	0	410	430	410	380	90	1560	570	160	250	68	3	69	2	16	2	51	1	92	1	57	1	88	1						
7	15	63	3500	20	290	770	0	0	0	2030	410	190	150	71	4	68	3	39	2	92	2	14	1										
8	5	63	3100	170	0	1630	0	0	0	910	420	760	540	69	3	38	2	45	2	92	1	68	1	3	1								
8	19	63	1700	0	0	350	0	70	20	860	370	220	70	69	2																		
9	3	63	800	0	0	480	0	0	0	190	110	320	110	38	1	69	1																
9	16	63	900	130	40	490	0	20	50	90	70	130	200	38	1	26	1																

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ORGANIC CHEMICALS

RECOVERED BY CARBON FILTER TECHNIQUE

RESULTS IN MICROGRAMS PER LITER
(Parts per billion)

STATE OHIO

MAJOR BASIN OHIO RIVER

MINOR BASIN OHIO RIVER MAIN STEM & MINOR TRIB.

STATION LOCATION OHIO RIVER BELOW
ADDISON, OHIO

117

DATE OF SAMPLE BEGINNING MONTH	DAY	YEAR	END MONTH	DAY	GALLONS FILTERED	EXTRACTABLES TOTAL	CHLORO-FORM	ALCOHOL	CHLOROFORM EXTRACTABLES ETHER INSOLUBLES	WATER SOLUBLES	NEUTRALS TOTAL	ALIPHATICS	AROMATICS	OXYGEN-ATED COMPOUNDS	LOSS	WEAK ACIDS	STRONG ACIDS	BASES	LOSS
10	19	62	10	27	5010#	252	71	181	2	14	31	2	3	26	0	9	6	2	7
11	14	62	11	28	5002#	225	143	82	9	37	39	6	5	27	1	14	16	1	27
12	17	62	12	28	4872	307	132	175	8	26	48	9	8	30	1	16	12	3	19
1	9	63	1	18	4967	216	83	133	3	12	43	12	8	22	1	13	4	1	7
1	29	63	2	9	5090	210	79	131	9	12	38	8	7	23	0	9	4	2	5
2	20	63	2	28	4937	195	80	115	3	16	35	5	5	24	1	9	6	2	9
3	25	63	4	3	5000#	117	44	73	1	7	25	10	5	10	0	4	2	0	5
4	16	63	4	22	3848#	231	82	149	7	17	30	6	4	18	2	9	7	1	11
5	6	63	5	15	4145	236	115	121	9	25	38	5	5	27	1	13	4	2	24
6	4	63	6	11	5040	164	86	78	4	20	26	3	2	20	1	9	9	1	17
7	1	63	7	12	5220#	226	116	110	4	30	30	1	2	25	2	13	13	2	24
8	5	63	8	17	5199#	270	140	130	4	32	40	4	4	32	0	17	23	2	22
9	3	63	9	13	5000	275	110	165	2	20	46	2	4	37	3	16	13	2	11

ESTIMATED

CHEMICAL, PHYSICAL AND BACTERIOLOGICAL ANALYSES

STATE OHIO

MAJOR BASIN OHIO RIVER

MINOR BASIN OHIO RIVER MAIN STEM & MINOR TRIB.

STATION LOCATION OHIO RIVER BELOW ADDISON, OHIO 117

DATE OF SAMPLE			TEMP. (Degrees Centigrade)	DISSOLVED OXYGEN mg/l	pH	B.O.D. mg/l	C.O.D. mg/l	CHLORINE DEMAND		AMMONIA-NITROGEN mg/l	CHLORIDES mg/l	ALKALINITY mg/l	HARDNESS mg/l	COLOR (scale units)	TURBIDITY (scale units)	SULFATES mg/l	PHOSPHATES mg/l	TOTAL DISSOLVED SOLIDS mg/l	COLIFORMS per 100 ml.
MONTH	DAY	YEAR						1-HOUR mg/l	24-HOUR mg/l										
10	1	62	19.0	7.0	7.4	-	16	2.9	4.4	.6	124	40	270	20	5	180	-	535	610
10	8	62	24.0	-	7.8	-	12	1.4	2.9	1.2	78	23	246	15	5	260	-	496	630
10	15	62	22.2	7.8	7.2	.0	17	.5	8.0	1.9	74	26	230	20	5	208	-	482	8300
10	22	62	20.5	7.5	7.0	7.5	8	1.4	3.0	1.5	74	24	234	15	10	220	-	483	730
10	29	62	16.0	10.0	7.1	9.9	15	1.2	4.5	1.8	88	27	246	25	10	225	-	508	390
11	5	62	13.0	9.3	7.4	.1	13	.5	6.2	1.1	60	23	196	25	10	155	-	366	970
11	12	62	13.3	8.6	7.1	8.6	21	1.1	4.7	2.3	36	19	130	25	50	100	.0	235	3000
11	19	62	12.0	9.8	7.1	9.8	16	1.1	1.9	1.2	30	25	122	25	30	108	-	276	570
11	26	62	10.0	10.5	7.4	10.4	25	.8	5.0	2.3	20	23	95	15	20	48	-	168	3000
12	3	62	8.0	11.5	7.0	1.9	9	.8	4.9	1.1	23	18	93	10	5	81	-	172	400
12	10	62	5.8	11.8	7.1	.6	7	.7	4.8	.7	32	23	117	10	5	89	-	215	430
12	17	62	2.5	12.6	7.2	.8	16	.9	6.7	1.4	43	30	138	10	5	95	-	244	220
12	26	62	4.3	12.9	7.0	.8	13	1.4	7.8	1.0	31	25	108	20	20	92	-	196	2200
12	31	62	1.8	13.0	7.1	2.0	10	1.6	5.7	.8	34	26	130	15	20	98	-	179	3000
1	8	63	2.9	14.1	7.2	1.2	11	.7	7.7	1.7	36	26	132	10	10	108	-	238	1800
1	14	63	4.4	8.0	7.2	1.2	14	1.4	6.9	2.0	30	32	128	20	160	86	-	197	2400
1	21	63	2.2	8.9	7.0	.6	10	.7	5.4	1.3	22	23	108	10	15	86	-	187	1100
1	28	63	2.0	14.2	7.2	.2	30	1.0	5.1	1.9	23	23	115	10	5	94	-	200	500
2	4	63	4.5	12.8	7.0	1.2	10	1.2	6.8	1.6	35	28	122	15	20	112	-	201	970
2	11	63	8.0	13.1	6.9	1.0	11	.3	-	.8	39	24	132	8	10	167	-	249	2400
2	18	63	3.8	13.9	7.0	1.0	12	.9	6.6	2.2	36	24	126	15	5	112	-	245	630
2	25	63	4.5	13.9	7.0	.7	19	1.1	6.7	.8	33	27	113	20	20	97	-	213	800
3	4	63	3.5	12.8	7.2	1.5	24	1.0	-	1.1	35	30	126	7	150	88	-	220	2200
3	11	63	6.2	11.5	7.3	2.0	37	2.2	7.6	.9	17	20	92	5	380	86	-	170	7100
3	18	63	9.0	12.0	6.8	.9	26	4.1	6.8	.7	27	24	100	10	300	58	-	149	4000
3	25	63	6.8	12.0	7.3	.6	23	3.2	6.0	1.3	20	16	79	12	230	61	-	138	3000
4	1	63	12.4	11.4	7.4	2.0	16	2.8	6.5	.9	18	20	84	15	135	51	-	136	5300
4	6	63	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	200
4	8	63	12.0	9.6	7.2	.2	14	2.2	4.6	1.4	20	29	100	5	20	74	-	146	-
4	15	63	11.2	10.4	7.3	.5	23	3.4	6.0	.5	29	34	115	10	10	81	-	190	500
4	22	63	15.7	8.7	7.3	1.0	10	1.1	6.0	.8	34	23	140	5	15	108	-	231	5000
4	29	63	15.0	9.4	7.6	.2	13	2.3	4.0	5.8	30	31	124	15	15	21	-	200	1500
5	6	63	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	300
5	13	63	19.2	9.8	7.4	2.8	9	1.0	3.8	2.0	40	32	143	7	5	108	-	258	-
5	20	63	20.2	8.6	7.1	1.3	10	3.8	5.1	.6	32	28	140	20	60	109	-	250	-
5	27	63	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1000
6	4	63	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1000
6	10	63	24.0	6.8	7.2	1.3	35	1.1	6.1	.9	35	40	152	10	40	120	-	292	1800

CHEMICAL, PHYSICAL AND BACTERIOLOGICAL ANALYSES

STATE: OHIO
MAJOR BASIN: OHIO RIVER
MINOR BASIN: OHIO RIVER MAIN STEM & MINOR TRIB.
STATION LOCATION: OHIO RIVER BELOW ADDISON, OHIO

DATE OF SAMPLE			TEMP. (Degrees Centigrade)	DISSOLVED OXYGEN mg/l	pH	B.O.D. mg/l	C.O.D. mg/l	CHLORINE DEMAND		AMMONIA-NITROGEN mg/l	CHLORIDES mg/l	ALKALINITY mg/l	HARDNESS mg/l	COLOR (Hazen units)	TURBIDITY (Hazen units)	SULFATES mg/l	PHOSPHATES mg/l	TOTAL DISSOLVED SOLIDS mg/l	COLIFORMS per 100 ml.
MONTH	DAY	YEAR						1-HOUR mg/l	24-HOUR mg/l										
6	17	63	23.0	6.7	7.2	1.2	12	1.2	4.6	.6	26	28	135	5	40	135	-	252	6300
6	24	63	24.0	8.1	7.5	1.2	13	2.1	4.3	.8	45	32	131	5	10	104	-	222	1800
7	1	63	27.0	7.2	7.3	1.1	12	2.0	3.5	.7	28	30	116	5	5	93	-	211	850
7	8	63	28.8	7.5	7.3	1.4	14	2.2	4.2	.7	35	36	147	5	10	125	-	286	1000
7	15	63	27.0	7.2	7.4	1.6	12	1.9	3.7	1.1	40	27	140	5	5	125	-	292	550
7	22	63	27.0	7.6	7.4	2.2	16	2.9	5.3	.6	46	31	168	5	5	132	-	304	300
7	29	63	28.0	7.6	7.6	1.5	15	3.1	5.2	.5	68	29	178	0	5	153	-	365	500
8	5	63	27.8	6.1	7.7	1.7	9	2.9	4.5	.8	85	33	188	5	5	160	-	430	300
8	12	63	27.8	5.5	7.2	1.4	13	4.4	7.0	1.6	42	24	135	30	50	130	-	290	1000
8	19	63	25.0	6.6	7.5	1.9	16	.8	6.8	.6	58	29	173	5	10	160	-	392	-
8	26	63	24.1	6.8	7.6	1.3	14	1.8	5.0	1.1	61	26	182	5	5	148	-	372	360
9	2	63	26.0	6.6	7.6	3.3	15	1.2	6.0	1.0	74	24	196	5	5	184	-	430	-
9	3	63	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	660
9	9	63	27.0	6.7	7.3	1.9	11	3.5	5.8	.4	60	20	194	3	0	160	-	407	360
9	16	63	24.0	6.3	7.4	1.1	10	1.0	5.0	1.0	60	25	216	5	5	231	-	465	5000
9	23	63	22.4	6.3	7.2	.7	13	.9	5.4	1.6	61	18	228	5	5	230	-	453	600
9	30	63	22.0	6.6	7.2	.5	10	.8	2.1	.7	68	20	228	0	5	232	-	440	500

STREAM FLOW DATA - 1962-1963

Thousand Cubic Feet per Second

PROVISIONAL--SUBJECT TO REVISION

Gaging Station at Pomeroy, Ohio
Operated by U.S. Geological Survey

STATE Ohio

MAJOR BASIN Ohio River

MINOR BASIN Ohio River-Main Stem and Minor Trib.

STATION LOCATION Ohio River below
Addison, Ohio

Day	October	November	December	January	February	March	April	May	June	July	August	September
1		40.200		36.000			183.000	38.000				
2		38.900		37.000		75.600	166.000	39.000				
3				35.000		89.300	145.000	38.000				
4				35.000	65.200	87.900	128.000	36.000				
5					72.700	220.000	115.000		58.300			
6					52.400	320.000	101.000		103.000			
7					60.400	340.000	91.800		104.000			
8					56.800	344.000	84.700		72.200			
9					51.100	292.000	73.100		50.000			
10		60.900				228.000	51.000		55.000			
11		73.900		39.500		210.000	44.000		72.000			
12		71.600		80.000	48.400	190.000	43.000		90.000			
13		66.100		92.200	53.100	190.000	36.000		92.000			
14		66.300		98.500	43.900	188.000			73.000			
15				99.000		184.000			37.000			
16		37.900		93.100		187.000						
17				83.700		240.000						
18				77.000		257.000						
19				46.000		252.000						
20		49.100		40.000		330.000	59.400					
21		40.800	40.000	42.000	35.100	349.000	70.500					
22		58.700	49.000	40.000	37.400	336.000	77.000					
23		64.000	58.000	41.000		319.000	85.000					
24		66.600	64.000	36.000		277.000	87.000					
25		59.900	60.000			234.000	80.000					
26		39.900	50.000			205.000	73.000					
27		37.000	41.000			191.000	52.000					
28			43.000			194.000	47.000					
29			45.000			203.000	40.000					
30			46.000			203.000	38.000					
31			45.000			195.000						

NOT AVAILABLE

DATA

OHIO RIVER AT TORONTO, OHIO

This is the uppermost Ohio River station of the PHS Water Pollution Surveillance System and is located on the west side of the Ohio River approximately 19 miles downstream from the Pennsylvania-West Virginia-Ohio State line. Water samples are collected from the raw water line of the Toronto water treatment plant. The carbon filter is located at the city water works of Weirton, West Virginia on the east side of the Ohio River, two miles below Toronto.

The Pittsburgh to Toronto reach of the Ohio River is heavily industrialized with steel and fabricated steel products being the principal activities. There is some acid mine drainage in the area.

Samples collected from the Ohio River during July had moderate numbers of algae. Unusually large rotifer counts of 900 per liter and crustacea counts of 435 per liter were observed in July 1963. These counts indicate considerable reproduction and growth induced by a plentiful supply of organic food.

Exploratory benthos samples were collected on July 31, 1963. The bottom sediments, though contaminated with some oil and tar-like substance, supported small populations of worms and midge larvae.

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Station Location: Ohio River at Toronto, Ohio

Major Basin: Ohio River

Minor Basin: Ohio River - Main Stem and Minor Tributary

Station at: 40°26' Latitude 80°37' Longitude

Miles above mouth: 926

Activation Date: July 1, 1963

Sampled by: Toronto Water and Sewer Department

Field Analysis by: U.S. Public Health Service

Other Cooperating Agencies: Ohio Department of Health

Hydrologic Data:

Nearest pertinent gaging station: Sewickley, Pennsylvania

Gaging station operated by: U.S. Geological Survey

Drainage area at gaging station: 19,500 square miles

Period of record: 1933 to present

Average discharge in record period: 32,530 cfs.

Maximum discharge in record period: 574,000 cfs.

Minimum discharge in record period: 1,800 cfs.

Remarks: Beaver River confluent to Ohio River between gaging station and surveillance station. Stream regulated by operations of navigation locks and tributary reservoirs.

ALKYL BENZENE SULFONATE (ABS)

Date	mg/l
7-1-63	0.11
7-8-63	0.10
7-15-63	0.11
8-12-63	0.11
8-19-63	0.12
8-26-63	0.14
9-3-63	0.11
9-9-63	0.10
9-16-63	0.10
9-23-63	0.14
9-30-63	0.11

ELEMENTAL ANALYSES

		Composite interval	
Analysis by wet or flame methods. Results in mg/l	F		
	Na		
	K		
Analysis by Spectrographic methods. Results in micrograms per liter	Zn		
	Cd		
	As		
	B		
	P		
	Fe		
	Mo		
	Mn		
	Al		
	Be		
	Cu		
	Ag		
	Ni		
	Co		
	Pb		
	Cr		
	V		
	Ba		
	Sr		

*Actual value is less than the amount shown. Reported result indicates limit of sensitivity at which test was performed. See text for explanation.

STRONTIUM 90 ACTIVITY

Composite interval	pc/l	±	Composite interval	pc/l	±
October to December	–	–	April to June	–	–
January to March	–	–	July to September	4.9	.4

± at 95% Confidence Limits

SPECIFIC QUALITATIVE IDENTIFICATIONS FROM CARBON ADSORPTION EXTRACTS WATER YEAR 1962-3

Interval	Compound	Concentration* ug/l

*Concentration values, where shown, are calculated from quantitative gas chromatographic analysis of the aromatic fractions of CCE, and may be assigned the units of ug/l. In light of the unknown efficiency of carbon adsorption sampling for these compounds, the reported values represent minima, the actual values being equal to or greater than the reported values.
See page 21.

RADIOACTIVITY DETERMINATIONS

STATE OHIO

MAJOR BASIN OHIO RIVER

MINOR BASIN OHIO RIVER-MAIN STEM & MINOR TRIB.

STATION LOCATION OHIO RIVER AT TORONTO, OHIO 129

DATE SAMPLE TAKEN			RADIOACTIVITY IN WATER												RADIOACTIVITY IN PLANKTON				
			DATE OF DETERMINATION		ALPHA					BETA					DATE OF DETERMINATION		GROSS ACTIVITY		
					SUSPENDED		DISSOLVED		TOTAL		SUSPENDED		DISSOLVED		TOTAL				ALPHA		BETA	
MO.	DAY	YR.	MO.	DAY	pc/l	±	pc/l	±	pc/l	±	pc/l	±	pc/l	±	pc/l	±	MO.	DAY	pc/g	±	pc/g	±
7	1	63	7	17	0	1	1	1	1	1	2	6	34	9	36	11						
7	8	63	7	24	0	0	0	1	0	1	0	20	29	9	29	22						
7	15	63	7	31	0	1	0	1	0	1	5	6	33	9	38	11						
7	22	63	8	12	0	1	1	1	1	1	4	3	27	4	31	5						
7	30	63	8	14	0	0	0	0	0	0	1	6	32	9	33	11						
8	6	63	8	19	0	0	0	0	0	0	5	3	30	5	35	6						
8	12	63	8	23	0	0	0	2	0	2	5	6	30	10	35	12						
8	19	63	9	6	1	1	0	2	1	2	2	6	25	16	27	17						
8	26	63	9	16	0	1	1	2	1	2	5	3	26	8	31	9						
9	3	63	9	17	0	0	2	2	2	2	7	6	22	16	29	17						
9	9	63	10	2	0	1	0	0	0	1	0	6	32	10	32	12						
9	16	63	10	2	0	0	0	1	0	1	0	7	23	15	23	17						
9	23	63	10	10	0	1	0	2	0	2	0	28	16	9	16	29						
9	30	63	10	17	1	1	1	2	2	2	3	5	23	10	26	11						

STATE OHIO

MAJOR BASIN OHIO RIVER

MINOR BASIN OHIO RIVER-MAIN STEM & MINOR TRIB.

STATION LOCATION OHIO RIVER AT EAST LIVERPOOL, OHIO 39

RADIOACTIVITY DETERMINATIONS

(This station has been relocated at Toronto, Ohio. Information about the East Liverpool station and data previously collected is contained in prior issuances of the Annual Compilation of Data.)

DATE SAMPLE TAKEN			RADIOACTIVITY IN WATER														RADIOACTIVITY IN PLANKTON					
			DATE OF DETERMINATION		ALPHA						BETA						DATE OF DETERMINATION		GROSS ACTIVITY			
					SUSPENDED		DISSOLVED		TOTAL		SUSPENDED		DISSOLVED		TOTAL				ALPHA		BETA	
MO.	DAY	YR.	MO.	DAY	pc/l	±	pc/l	±	pc/l	±	pc/l	±	pc/l	±	pc/l	±	MO.	DAY	pc/g	±	pc/g	±
11	9	62	12	20	0	1	0	1	0	1	1	5	13	6	14	8						
12	4	62	12	28	0	1	0	0	0	1	6	6	11	7	17	9						
1	21	63	2	26*	0	0	0	0	0	0	0	6	15	8	15	10						
2	5	63	3	27	1	1	1	1	2	1	14	6	14	8	28	10						

CHEMICAL, PHYSICAL AND BACTERIOLOGICAL ANALYSES

STATE OHIO

MAJOR BASIN OHIO RIVER

MINOR BASIN OHIO RIVER-MAIN STEM & MINOR TRIB.

STATION LOCATION OHIO RIVER AT TORONTO, OHIO

129

DATE OF SAMPLE			TEMP. (Degrees Centigrade)	DISSOLVED OXYGEN mg/l	pH	B.O.D. mg/l	C.O.D. mg/l	CHLORINE DEMAND		AMMONIA-NITROGEN mg/l	CHLORIDES mg/l	ALKALINITY mg/l	HARDNESS mg/l	COLOR (scale units)	TURBIDITY (scale units)	SULFATES mg/l	PHOSPHATES mg/l	TOTAL DISSOLVED SOLIDS mg/l	COLIFORMS per 100 ml.
MONTH	DAY	YEAR						1-HOUR mg/l	24-HOUR mg/l										
7	1	63	25.5	-	6.9	-	-	-	-	-	9	18	116	0	*25	100	.0	200	-
7	8	63	25.5	-	7.0	-	-	-	-	-	19	16	128	0	*25	130	.0	270	6300
7	15	63	26.0	-	7.0	-	-	-	-	-	16	12	144	0	*25	165	.0	260	2900
7	22	63	26.0	-	6.8	-	-	-	-	-	20	14	136	0	*25	160	.0	280	1000
7	29	63	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1600
7	30	63	27.5	-	6.9	-	-	-	-	-	29	12	164	0	*25	172	.0	330	-
8	6	63	28.0	-	6.8	-	-	-	-	-	27	14	164	0	*25	172	.0	330	2600
8	12	63	28.0	-	7.0	-	-	-	-	-	30	10	160	10	*25	170	.0	380	21000
8	19	63	25.0	-	6.9	-	-	-	-	-	30	8	190	5	*25	240	.0	440	1200
8	26	63	24.5	-	6.9	-	-	-	-	-	39	4	180	0	*25	220	.0	370	13000
9	3	63	25.0	-	6.7	-	-	-	-	-	26	10	200	0	*25	240	.0	400	1700
9	9	63	23.0	-	6.8	-	-	-	-	-	25	6	180	0	*25	210	.0	360	8800
9	16	63	24.0	-	6.8	-	-	-	-	-	27	4	168	0	*25	220	.0	370	24000
9	23	63	22.5	-	6.8	-	-	-	-	-	24	6	152	0	*25	184	.0	350	1800
9	30	63	-	-	-	-	-	-	-	-	26	8	160	5	*25	196	.0	350	1000

PLANKTON POPULATION

STATE OHIO
MAJOR BASIN OHIO RIVER
MINOR BASIN OHIO RIVER-MAIN STEM & MINOR TRIB.
STATION LOCATION OHIO RIVER AT
TORONTO, OHIO 129

DATE OF SAMPLE			DOMINANT SPECIES OF DIATOMS AND PERCENT OF TOTAL DIATOMS (See text for Codes)									FUNGI AND SHEATHED BACTERIA Number per ml.	MICROINVERTEBRATES																				
			1ST		2ND		3RD		4TH		OTHER SPECIES PERCENT		PROTOZOA (Identifiable) Number per ml.	ROTIFERS											CRUSTACEA							NEMATODES (Identifiable) Number per liter	OTHER ANIMAL FORMS (Number per liter)
														NUMBER PER LITER	GENERA AND COUNT LEVEL (See text for Codes) 1ST		2ND		3RD		4TH		5TH		NUMBER PER LITER	GENERA AND COUNT LEVEL (See text for Codes) 1ST		2ND		3RD			
MONTH	DAY	YEAR	SPECIES	PERCENT	SPECIES	PERCENT	SPECIES	PERCENT	SPECIES	PERCENT					GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL		GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL		
7	1	63	82	15	26	14	56	13	9	10	48	-	-	-											-							-	-
7	15	63	56	38	26	29	70	9	82	4	20	-	-	906	11	7	18	5	17	5	46	4	2	3	128	51	5	50	4	76	2	0	0
8	6	63	56	93	26	2	70	1	36	1	3	-	-	-											-							-	-
8	19	63										-	-	-											-							-	-
9	3	63										-	-	-											-							-	-
9	16	63										-	-	-											-							-	-

PLANKTON POPULATION

STATE OHIO

MAJOR BASIN OHIO RIVER

MINOR BASIN OHIO RIVER-MAIN STEM & MINOR TRIB.

STATION LOCATION OHIO RIVER AT
TORONTO, OHIO

129

DATE OF SAMPLE			ALGAE (Number per milliliter)									INERT DIATOM SHELLS		MOST ABUNDANT ALGAE - Genera and Count Level per ml. (See text for Codes)																	
			TOTAL	BLUE-GREEN		GREEN		FLAGELLATED (Pigmented)		DIATOMS				1ST		2ND		3RD		4TH		5TH		6TH		7TH		8TH		9TH		10TH	
MONTH	DAY	YEAR		COCCOID	FILAMENTOUS	COCCOID	FILAMENTOUS	GREEN	OTHER	CENTRIC	PENNATE	CENTRIC	PENNATE	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL
7	1	63	3700	20	20	3250	0	60	20	210	100	80	60	25	2	38	2																
7	15	63	5900	0	70	3700	0	70	180	750	1120	290	40	38	4	88	2	68	2	25	2	34	2	26	1	32	1	92	1	69	1	40	1
8	6	63	3700	30	0	1530	0	30	0	1620	520	440	620	69	4	38	2	26	1	24	1	45	1										
8	19	63	1800	20	0	1180	0	0	80	440	60	40	120	38	2	69	1	44	1														
9	3	63	4800	40	0	3520	0	480	40	460	290	420	40	38	4	51	2	24	1	45	1	69	1										
9	16	63	1300	0	0	680	0	160	0	270	110	0	20	69	1	38	1	35	1														

PLANKTON POPULATION

(This station has been relocated at Toronto, Ohio. Information about the East Liverpool station and data previously collected is contained in prior issuances of the Annual Compilation of Data.)

STATE OHIO

MAJOR BASIN OHIO RIVER

MINOR BASIN OHIO RIVER-MAIN STEM & MINOR TRIB.

STATION LOCATION OHIO RIVER AT EAST LIVERPOOL, OHIO 039

DATE OF SAMPLE			DOMINANT SPECIES OF DIATOMS AND PERCENT OF TOTAL DIATOMS (See text for Codes)									FUNGI AND SHEATHED BACTERIA Number per ml.	MICROINVERTEBRATES																					
			1ST		2ND		3RD		4TH				PROTOZOA (Identifiable) Number per ml.	ROTIFERS												CRUSTACEA									
															GENERA AND COUNT LEVEL (See text for Codes)													GENERA AND COUNT LEVEL (See text for Codes)							
														NUMBER PER LITER	1ST		2ND		3RD		4TH		5TH			NUMBER PER LITER	1ST		2ND		3RD			
MONTH	DAY	YEAR	SPECIES	PERCENT	SPECIES	PERCENT	SPECIES	PERCENT	SPECIES	PERCENT	OTHER SPECIES PERCENT				GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL			GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	ISTARTORES (Identifiable) Number per liter	OTHER ANIMAL FORMS (Number per liter)
10	3	62	56	20	57	18	26	15	92	9	38	-	-	156	2	4	11	4	18	3					72	76	4	50	4			0	0
10	16	62	56	18	26	17	57	8	23	6	51	-	-	165	2	5	15	1							15	50	2	76	2			0	0
11	9	62	82	31	26	10	56	9	92	8	42	-	-	0											0							0	0
11	19	62	9	13	26	8	92	8	36	8	63	-	-	3											0							0	0
12	3	62	9	46	82	8	80	7	71	3	36	-	-	2											0							1	0
12	17	62										-	-	0											0							0	0
1	4	63										-	-	0											0							0	0
1	21	63	82	30	71	7	43	5	64	4	54	-	-	0											0							0	0
2	5	63	82	16	9	9	33	8	70	7	60	-	-	0											0							0	0
2	19	63										-	-	0											0							0	0
3	8	63										-	-	-											-							-	-
3	18	63										-	-	-											-							-	-
4	9	63	92	9	57	9	27	8	26	8	66	-	-	1											0							0	0
4	17	63										-	-	0											0							0	0
5	8	63	92	38	82	19	31	8	67	7	28	-	-	285	2	6									0							0	0
5	20	63										-	-	354	2	7									0							0	0
6	3	63	92	26	82	11	51	7	70	7	49	-	-	617	2	7	11	2	17	1					0							1	0
6	19	63	9	29	95	15	82	7	92	7	42	-	-	8	2	1									2							0	0
7	12	63	26	31	56	28	70	10	82	4	27	-	-	1240	11	8	18	6	2	5	17	5	22	4	22	51	3	76	2			0	0
8	7	63	56	43	26	24	70	8	82	5	20	-	-	359	11	6	17	5	18	4	2	1			11	76	3					0	0
8	19	63	56	62	23	13	26	6	92	4	15	-	-	-											-							-	-

PLANKTON POPULATION

(This station has been relocated at Toronto, Ohio. Information about the East Liverpool station and data previously collected is contained in prior issuances of the Annual Compilation of Data.)

STATE OHIO

MAJOR BASIN OHIO RIVER

MINOR BASIN OHIO RIVER-MAIN STEM & MINOR TRIB.

STATION LOCATION OHIO RIVER AT
EAST LIVERPOOL, OHIO 39

DATE OF SAMPLE			ALGAE (Number per milliliter)										MOST ABUNDANT ALGAE - Genera and Count Level per ml. (See text for Codes)																			
			TOTAL	BLUE-GREEN		GREEN		FLAGELLATED (Pigmented)		DIATOMS		INERT DIATOM SHELLS		1ST		2ND		3RD		4TH		5TH		6TH		7TH		8TH		9TH		10TH	
MONTH	DAY	YEAR		COCCOID	FILAMENTOUS	COCCOID	FILAMENTOUS	GREEN	OTHER	CENTRIC	PENNATE	CENTRIC	PENNATE	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL
10	3	62	2700	130	170	1540	0	60	0	250	510	40	340	38	3	40	1	68	1	25	1	92	1										
10	16	62	800	80	0	150	0	390	0	80	80	40	0	51	2																		
11	9	62	800	0	60	80	0	620	0	0	40	0	0	51	3																		
11	19	62	600	0	0	40	20	80	0	80	370	0	40																				
12	3	62	200	0	0	50	0	20	0	90	90	0	50																				
12	17	62	200	0	0	40	0	40	0	80	80	0	0																				
1	4	63	00	0	0	20	0	0	0	20	0	0	0																				
1	21	63	100	0	0	20	0	0	0	30	20	20	110																				
2	5	63	00	0	0	0	0	0	0	0	0	0	50																				
2	19	63	200	0	0	20	0	0	130	20	0	40	20																				
3	8	63	800	0	40	40	0	20	0	60	670	210	1450																				
3	18	63	2000	0	0	110	0	0	20	330	1560	460	1980	69	1																		
4	9	62	500	0	30	40	0	10	240	60	140	60	110	65	1																		
4	17	63	800	0	0	20	0	730	0	0	20	0	70																				
5	8	63	200	0	0	90	0	0	0	40	110	0	130																				
5	20	63	100	0	0	0	0	0	0	20	60	0	30																				
6	3	63	400	0	0	130	0	200	0	20	70	0	70																				
6	19	63	2200	70	70	1210	0	530	0	240	70	20	130	51	2	38	2	26	1	25	1												
7	12	63	3300	0	0	2960	0	60	0	150	170	40	40	38	4	25	2	34	1														
8	7	63	700	0	0	330	0	20	0	290	20	120	60	68	1																		
8	19	63	4300	20	0	3510	0	130	0	500	130	130	300	24	4	38	3	25	3	69	2	31	2	45	1	45	1						

STREAM FLOW DATA - 1962-1963

Thousand Cubic Feet per Second

PROVISIONAL--SUBJECT TO REVISION

Gaging Station at Sewickley, Pennsylvania
Operated by U.S. Geological Survey

STATE Ohio

MAJOR BASIN Ohio River

MINOR BASIN Ohio River-Main Stem & Minor Trib.

STATION LOCATION Ohio River at
Toronto, Ohio

Day	October	November	December	January	February	March	April	May	June	July	August	September
1	12.600	36.400	15.700	22.800	13.400	13.000	92.700	22.800	14.500	5.560	6.920	6.980
2	14.500	33.700	13.700	19.800	14.600	29.100	83.500	22.800	13.200	6.040	6.650	4.920
3	12.800	31.900	12.400	21.200	20.600	41.100	72.400	22.800	10.400	17.300	7.400	4.460
4	11.900	25.200	13.000	20.500	35.500	59.900	63.600	21.200	12.400	18.200	8.240	5.720
5	14.000	22.000	12.300	18.300	33.700	151.000	63.600	19.000	18.000	9.520	12.800	9.680
6	14.600	19.800	11.900	15.400	37.300	194.000	59.400	15.600	35.500	8.100	13.800	10.400
7	13.400	16.600	13.400	12.400	35.500	152.000	51.000	17.600	30.200	7.370	9.990	8.500
8	11.800	14.900	13.100	12.600	31.900	122.000	42.000	15.600	27.600	5.880	7.820	7.820
9	11.400	14.100	11.900	13.400	26.800	104.000	35.500	14.500	26.800	5.560	6.920	5.480
10	12.900	15.300	11.000	14.800	19.800	90.400	31.000	13.200	22.000	5.480	6.380	5.400
11	13.200	27.300	10.500	22.500	19.000	88.100	28.500	15.900	34.300	5.240	5.640	6.120
12	10.500	50.000	10.600	40.300	23.600	76.800	24.400	16.300	63.600	4.760	5.000	6.200
13	10.100	43.000	8.700	68.000	26.800	95.000	22.000	16.200	36.400	4.840	5.000	6.470
14	10.100	35.500	7.730	72.400	22.000	104.000	20.500	16.500	27.600	5.560	5.800	6.040
15	9.110	34.600	7.460	63.600	19.800	109.000	18.300	15.800	22.000	4.760	7.280	5.640
16	9.110	31.000	7.910	57.300	15.900	107.000	17.300	18.300	19.000	4.530	7.190	5.240
17	9.000	29.400	9.660	46.000	13.700	104.000	16.800	17.200	13.200	5.080	7.010	5.400
18	8.400	22.000	11.800	36.400	11.600	147.000	19.000	19.000	11.900	5.240	6.380	5.640
19	8.300	25.200	16.600	29.400	16.600	152.000	20.500	19.000	9.770	5.480	5.480	5.320
20	9.440	32.800	19.000	26.800	19.000	187.000	32.800	20.500	8.700	7.030	5.320	5.160
21	9.110	31.000	22.800	22.800	19.800	211.000	47.000	22.800	9.550	5.720	5.720	5.000
22	7.730	31.900	26.800	25.200	20.500	162.000	51.000	23.600	10.600	6.470	7.730	4.390
23	7.190	42.000	36.400	23.600	16.900	148.000	48.000	21.200	8.700	8.200	7.010	3.830
24	7.640	44.000	37.300	19.000	14.200	130.000	45.000	21.200	7.460	8.100	6.740	3.900
25	7.460	41.100	31.900	14.200	13.500	117.000	45.000	19.000	7.190	8.200	6.040	4.460
26	7.460	38.200	26.800	13.200	12.800	125.000	39.200	14.400	7.280	7.550	5.240	4.180
27	8.900	33.700	27.600	14.500	11.100	142.000	34.600	12.000	6.290	7.010	4.680	3.760
28	9.110	29.400	25.200	13.600	11.000	144.000	26.800	15.000	6.120	6.470	5.480	3.760
29	9.220	22.800	23.200	13.500		135.000	22.800	14.100	5.960	5.320	5.320	3.970
30	11.600	17.600	25.200	13.600		127.000	22.800	13.100	6.120	5.400	5.560	3.900
31	25.000		22.800	13.000		114.000		13.000		6.120	6.200	

STREAM FLOW DATA - 1962-1963

Thousand Cubic Feet per Second

PROVISIONAL--SUBJECT TO REVISION

Gaging Station at Sewickley, Pennsylvania
Operated by U.S. Geological Survey

(This station has been relocated at Toronto, Ohio. Information about the East Liverpool station and data previously collected is contained in prior issuances of the Annual Compilation of Data.)

STATE: Ohio

MAJOR BASIN: Ohio River

MINOR BASIN: Ohio River-Main Stem & Minor Trib.

STATION LOCATION: Ohio River at East Liverpool, Ohio

Day	October	November	December	January	February	March	April	May	June	July	August	September
1	12.600	36.400	15.700	22.800	13.400	13.000	92.700	22.800	14.500	5.560	6.980	6.980
2	14.500	33.700	13.700	19.800	14.600	29.100	83.500	22.800	13.200	6.040	6.650	4.920
3	12.800	31.900	12.400	21.200	20.600	41.100	72.400	22.800	14.000	17.300	7.400	4.460
4	11.900	25.200	13.000	20.500	35.500	59.900	63.600	21.200	12.400	18.200	8.240	5.720
5	14.000	22.000	12.300	18.300	33.700	151.000	63.600	19.000	18.000	9.520	12.800	9.680
6	14.600	19.800	11.900	15.400	37.300	194.000	59.400	15.600	35.500	8.100	13.800	10.400
7	13.400	16.600	13.400	12.400	35.500	152.000	51.000	17.600	30.200	7.370	9.990	8.500
8	11.800	14.900	13.100	12.600	31.900	122.000	42.000	15.600	27.600	5.880	7.820	7.820
9	11.400	14.100	11.900	13.400	26.800	104.000	35.500	14.500	26.800	5.560	6.980	5.480
10	12.900	15.300	11.000	14.800	19.800	90.400	31.000	13.200	22.000	5.480	6.380	5.400
11	13.200	27.300	10.500	22.500	19.000	88.100	28.500	15.900	34.300	5.240	5.640	6.120
12	10.500	50.000	10.600	40.300	23.600	76.800	24.400	16.300	63.600	4.760	5.000	6.200
13	10.100	43.000	8.700	68.000	26.800	95.000	22.000	16.200	36.400	4.840	5.000	6.470
14	10.100	35.500	7.730	72.400	22.000	104.000	20.500	16.500	27.600	5.560	5.800	6.040
15	9.110	34.600	7.460	63.600	19.800	109.000	18.300	15.800	22.000	4.760	7.280	5.640
16	9.110	31.000	7.910	57.300	15.900	107.000	17.300	18.300	19.000	4.530	7.190	5.240
17	9.000	29.400	9.660	46.000	13.700	104.000	16.800	17.200	13.200	5.080	7.010	5.400
18	8.400	22.000	11.800	36.400	11.600	147.000	19.000	19.000	11.900	5.240	6.380	5.640
19	8.300	25.200	16.600	29.400	16.600	152.000	20.500	19.000	9.770	5.480	5.480	5.320
20	9.440	32.800	19.000	26.800	19.000	187.000	32.800	20.500	8.700	7.030	5.320	5.160
21	9.110	31.000	22.800	22.800	19.800	211.000	47.000	22.800	9.550	5.720	5.720	5.000
22	7.730	31.900	26.800	25.200	20.500	162.000	51.000	23.600	10.600	6.470	7.730	4.390
23	7.190	42.000	36.400	23.600	16.900	148.000	48.000	21.200	8.700	8.200	7.010	3.830
24	7.640	44.000	37.300	19.000	14.200	130.000	45.000	21.200	7.460	8.100	6.740	3.900
25	7.460	41.100	31.900	14.200	13.500	117.000	45.000	19.000	7.190	8.200	6.040	4.460
26	7.460	38.200	26.800	13.200	12.800	125.000	39.200	14.400	7.280	7.550	5.240	4.180
27	8.900	33.700	27.600	14.500	11.100	142.000	34.600	12.000	6.290	7.010	4.680	3.760
28	9.110	29.400	25.200	13.600	11.000	144.000	26.800	15.000	6.120	6.470	5.480	3.760
29	9.220	22.800	25.200	13.500		135.000	22.800	14.100	5.960	5.380	5.320	3.970
30	11.600	17.600	25.200	13.600		127.000	22.800	13.100	6.120	5.400	5.560	3.900
31	25.000		22.800	13.000		114.000		13.000		6.120	6.200	

WABASH RIVER AT NEW HARMONY, INDIANA

Samples are collected at pier C of U.S. Highway 460 Bridge. This station is located on the Indiana State line approximately 52 miles above the confluence of the Ohio and Wabash Rivers. The Wabash River originates in western Ohio, flows in a westerly direction across northern Indiana, turns towards the south, and becomes the Indiana-Illinois boundary from near Terre Haute, Indiana to its junction with the Ohio River.

Between New Harmony and Clinton, Indiana, located about 15 miles north of Terre Haute, the Wabash River receives wastes, after primary treatment, from 8 municipalities having a combined sewered population of approximately 111,700. Industrial sources of pollution are from a complex of industries including chemical, meat packing, paper mills, wood treatment, and food processing.

The October 16, 1963 sample from this station had a large increase in total algae. The total count was 87,890 per ml. The next sample collected on October 29, showed an even higher rise to 153,636 per ml. Although significant variations occasionally occur, samples collected from this station generally are less than 15,000 per ml.

Bottom samples were collected on May 15, and August 14, 1963. A tentative analysis of the results indicates that the muddy bottoms harbored small populations of worms and midge larvae. The population had little diversity. Hydropsychid larvae dominated the habitats at the falls downstream from the station.

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Station Location: Wabash River at New Harmony, Indiana

Major Basin: Ohio River

Minor Basin: Wabash River

Station at: 38°08' Latitude 87°56' Longitude

Miles above mouth: 52

Activation Date: January 10, 1962

Sampled by: White County (Illinois) Bridge Commission
Indiana State Board of Health

Field Analysis by: Indiana State Board of Health

Other Cooperating Agencies:

Hydrologic Data:

Nearest pertinent gaging station: Mt. Carmel, Illinois

Gaging station operated by: U.S. Geological Survey

Drainage area at gaging station: 28,600 square miles

Period of record: 1927 to present

Average discharge in record period: 26,980 cfs.

Maximum discharge in record period: 305,000 cfs.

Minimum discharge in record period: 1,620 cfs.

Remarks:

ALKYL BENZENE SULFONATE (ABS)

Date	mg/l
3-4-63	0.22
3-17-63	0.07
3-23-63	0.05
3-31-63	0.05
4-15-63	0.05
4-25-63	0.07

ELEMENTAL ANALYSES

		Composite Interval 10/1/62 to 12/31/62	Composite Interval 4/1/63 to 6/30/63
Analysis by wet or flame methods. Results in mg/l	F	.36	.25
	Na	22	13
	K	3.3	3.2
Analysis by Spectrographic methods. Results in micrograms per liter	Zn	158	24
	Cd	*4	8
	As	*38	*10
	B	76	70
	P	*10	68
	Fe	46	17
	Mo	*4	60
	Mn	*1.9	4.6
	Al	—	40
	Be	*.1	*.08
	Cu	124	15
	Ag	*.8	.9
	Ni	114	5
	Co	*8	*3
	Pb	57	15
	Cr	*2	12
	V	*4	*15
	Ba	38	21
	Sr	228	100

*Actual value is less than the amount shown. Reported result indicates limit of sensitivity at which test was performed. See text for explanation.

STRONTIUM 90 ACTIVITY

Composite Interval	pc/l	±	Composite Interval	pc/l	±
October to December	1.4	.3	April to June	3.1	.4
January to March	—	—	July to September	—	—

± at 95% Confidence Limits

SPECIFIC QUALITATIVE IDENTIFICATIONS FROM CARBON ADSORPTION EXTRACTS WATER YEAR 1962-3

Interval	Compound	Concentration* ug/l

*Concentration values, where shown, are calculated from quantitative gas chromatographic analysis of the aromatic fractions of CCE, and may be assigned the units of ug/l. In light of the unknown efficiency of carbon adsorption sampling for these compounds, the reported values represent minima, the actual values being equal to or greater than the reported values.
See page 21.

RADIOACTIVITY DETERMINATIONS

STATE INDIANA

MAJOR BASIN OHIO RIVER

MINOR BASIN WABASH RIVER

STATION LOCATION WABASH RIVER AT NEW HARMONY, INDIANA 105

DATE SAMPLE TAKEN			RADIOACTIVITY IN WATER												RADIOACTIVITY IN PLANKTON				
			DATE OF DETERMINATION		ALPHA						BETA						GROSS ACTIVITY		
					SUSPENDED		DISSOLVED		TOTAL		SUSPENDED		DISSOLVED		TOTAL		ALPHA		BETA	
MO.	DAY	YR.	MO.	DAY	pc/l	±	pc/l	±	pc/l	±	pc/l	±	pc/l	±	pc/l	±	DATE OF DETERMINATION MO. DAY	pc/g ±	pc/g ±
10	2	62	10	23	3	3	0	2	3	4	42	16	35	9	77	18			
10	9	62	11	5	3	2	0	1	3	2	42	18	251	12	293	22			
10	13	62	11	2	0	1	0	1	0	1	6	14	23	15	29	21			
10	22	62	11	8	0	1	2	2	2	2	3	11	22	14	25	18			
10	29	62	11	21	0	1	0	1	0	1	24	13	41	16	65	21			
11	3	62	11	28	1	1	3	2	4	2	4	11	38	14	42	18			
11	10	62	12	4	1	1	1	1	2	1	16	12	21	15	37	19			
11	19	62	12	4	3	3	0	2	3	4	89	19	39	16	128	25			
11	26	62	12	26	12	10	1	2	13	10	175	66	50	14	225	67			
12	8	62	1	2	3	2	1	2	4	3	42	10	17	11	59	15			
12	16	62	1	7	0	1	2	2	2	2	2	7	13	9	15	11			
1	5	63	1	16	0	1	1	2	1	2	39	14	37	17	76	22			
1	22	63	1	30	0	1	1	2	1	2	18	13	43	17	61	21			
2	3	63	2	14	0	1	0	2	0	2	23	12	46	17	69	21			
2	11	63	2	26	0	1	2	2	2	2	22	13	40	18	62	23			
2	17	63	3	4	1	1	1	2	2	2	28	6	46	8	74	10			
2	25	63	3	11	0	1	2	2	2	2	17	6	137	9	154	11			
3	4	63	3	25	1	1	0	1	1	1	35	7	45	9	80	11			
3	10	63	3	27	4	3	0	1	4	3	380	24	164	10	544	26			
3	17	63	3	28	3	2	0	1	3	2	243	16	145	8	388	18			
3	31	63	4	18	3	2	2	1	5	2	107	10	67	9	174	13			
4	7	63	5	6	-	-	-	-	-	-	49	4	67	4	116	6			
4	15	63	5	1	1	1	0	2	1	2	9	12	34	15	43	19			
4	22	63	5	6	0	1	2	2	2	2	32	6	58	7	90	9			
4	28	63	5	15	0	1	0	1	0	1	28	6	87	10	115	12			
5	6	63	5	27	1	1	2	2	3	2	32	7	52	7	84	10			
5	20	63	6	5	7	4	1	1	8	4	205	21	75	14	280	25			
5	25	63	6	7	3	2	0	2	3	3	52	15	46	9	98	17			
6	3	63	6	12	7	7	2	2	9	7	117	64	25	14	142	66			
6	11	63	6	25	2	2	1	2	3	3	47	13	38	14	85	19			
6	17	63	7	10	16	13	1	1	17	13	384	53	73	9	457	54			
6	25	63	7	10	0	0	1	2	1	2	7	5	46	15	53	16			
6	29	63	7	17	0	1	0	0	0	1	10	5	38	9	48	10			
7	10	63	7	23	2	2	1	1	3	2	83	17	25	14	108	22			
7	30	63	8	14	2	2	0	1	2	2	60	15	51	9	111	17			
8	4	63	8	16	0	1	0	1	0	1	4	6	31	8	35	10			
8	10	63	8	21	0	0	1	2	1	2	3	6	22	8	25	10			
8	17	63	8	27	0	0	3	2	3	2	5	5	40	8	45	9			
9	2	63	9	17	1	1	1	2	2	2	12	7	25	8	37	11			
9	7	63	9	23	0	1	21	6	21	6	4	3	47	8	51	9			
9	14	63	10	1	0	0	0	1	0	1	5	3	13	8	18	9			
9	21	63	10	10	0	0	0	0	0	0	0	7	16	9	16	11			
9	28	63	10	14	0	1	0	2	0	2	0	13	21	4	21	14			

PLANKTON POPULATION

STATE INDIANA

MAJOR BASIN OHIO RIVER

MINOR BASIN WABASH RIVER

STATION LOCATION WABASH RIVER AT NEW HARMONY, INDIANA

DATE OF SAMPLE			DOMINANT SPECIES OF DIATOMS AND PERCENT OF TOTAL DIATOMS (Box test for Codes)									FUNGI AND SHEATHED BACTERIA Number per mL	MICROINVERTEBRATES																					
			1ST		2ND		3RD		4TH				PROTOZOA (Identifiable) Number per mL	ROTIFERS														CRUSTACEA								
															GENERA AND COUNT LEVEL (Box test for Codes)													GENERA AND COUNT LEVEL (Box test for Codes)							
														NUMBER PER LITER	1ST		2ND		3RD		4TH		5TH		NUMBER PER LITER	1ST		2ND		3RD		DESMIDS (Identifiable) Number per liter	OTHER ALGAL CELLS (Number per liter)
MONTH	DAY	YEAR	SPECIES	PERCENT	SPECIES	PERCENT	SPECIES	PERCENT	SPECIES	PERCENT	OTHER SPECIES PERCENT				GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL		GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL		
10	1	62	26	81	58	5	23	4	82	4	6			0											0							0	0
10	16	62	61	45	26	23	82	14	23	8	10			3											0							0	0
10	29	62	97	54	26	32	82	3	92	1	10			3											0							0	0
11	13	62	26	58	82	18	27	11	23	2	11			0											0							0	0
11	27	62	82	73	26	11	92	3	71	2	11			0											0							0	0
12	10	62	82	80	26	7	51	2	71	2	9			1											0							0	0
12	26	62	82	93	92	3	71	1	72	1	2			1											0							0	0
3	5	63												-											0							-	0
3	19	63												-											0							-	0
4	1	63	92	42	36	11	26	8	21	5	34			0											0							0	0
4	15	63	26	22	92	21	82	19	80	8	30			4											2							0	0
5	13	63	82	61	89	8	27	7	92	6	18			-											-							-	-
5	27	63	82	33	27	25	26	12	92	5	25			-											-							-	-
6	10	63	82	73	23	11	26	7	86	2	7			-											-							-	-
8	6	63												-											-							-	-
8	19	63												-											-							-	-
9	4	63												-											-							-	-
9	17	63												-											-							-	-

PLANKTON POPULATION

STATE INDIANA

MAJOR BASIN OHIO RIVER

MINOR BASIN WABASH RIVER

STATION LOCATION WABASH RIVER AT NEW HARMONY, INDIANA 105

DATE OF SAMPLE			ALGAE (Number per milliliter)									INERT DIATOM SHELLS		MOST ABUNDANT ALGAE - Genera and Count Level per ml. (See text for Codes)																	
			TOTAL	BLUE-GREEN		GREEN		FLAGELLATED (Pigmented)		DIATOMS				1ST		2ND		3RD		4TH		5TH		6TH		7TH		8TH		9TH		10TH	
MONTH	DAY	YEAR		COCCOID	FILAMENTOUS	COCCOID	FILAMENTOUS	GREEN	OTHER	CENTRIC	PENNATE	CENTRIC	PENNATE	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL
10	1	62	3380	320	90	3060	0	180	0	29250	900	6840	590	69	8	68	5	38	3	26	3	92	2	3	2	35	1	88	1	24	1	71	1
10	16	62	87900	5050	250	24720	0	370	170	55480	1860	7870	1450	69	8	24	8	68	8	71	6	3	5	25	3	88	3	38	3	92	3	5	3
10	29	62	153600	4220	40	11970	0	5180	70	126890	5180	11180	1040	69	9	68	9	25	6	71	6	51	5	3	5	38	4	92	3	87	3	33	3
11	13	62	30900	860	1940	3290	0	2210	1710	20030	860	10710	900	68	7	71	5	69	5	51	4	17	4	57	4	26	4	3	3	24	3	38	2
11	27	62	97000	210	2070	8240	0	7080	40	73570	5800	7040	210	51	6	69	6	25	6	24	4	17	4	38	2	57	1	3	1				
12	10	62	14300	0	180	140	0	1890	0	11520	540	1400	90	71	7	57	4	68	3	51	2	69	2	17	1								
12	26	62	15700	0	90	220	0	1300	0	12960	1120	130	70	71	7	65	3	51	3	92	2	88	1	26	1								
3	5	63	1900	0	20	20	0	240	90	110	1450	90	260	52	1																		
3	19	63	200	0	0	20	0	70	40	40	40	40	40																				
4	1	63	400	0	20	0	0	40	110	110	170	80	170																				
4	15	63	38700	250	1970	2480	0	2140	1970	25490	4370	4450	500	71	7	68	7	51	4	92	4	26	4	63	4	17	4	88	2	62	2	77	2
5	13	63	24300	110	750	2860	0	660	20	17820	2090	6690	1630	69	6	92	4	38	3	16	2	25	2	26	2	34	2	88	2	24	2	51	2
5	27	63	36500	80	3320	6360	0	210	420	23960	2160	1230	340	68	7	71	7	24	5	15	5	69	4	38	4	92	3	12	3	88	2	34	2
6	10	63	12600	330	130	4490	0	1170	20	6070	400	9550	730	71	5	24	4	68	3	69	3	38	3	26	3	51	2	52	2	3	2	35	1
8	6	63	40600	400	350	15110	0	580	400	22790	920	9680	310																				
8	19	63	33300	260	90	8160	0	510	40	22970	1250	6340	180	69	6	38	5	24	4	25	3	35	3	51	2	30	1	3	1	45	1	44	1
9	4	63	28000	170	20	7740	0	2470	0	15740	1720	9850	730	38	5	69	4	24	4	55	4	51	3	31	2	25	2	41	2	30	2	45	1
9	17	63	84800	850	0	11110	0	180	0	71900	760	16800	360	38	5	25	4	30	3	24	3	26	3	2	2	41	2	44	2	35	2	9	1

ORGANIC CHEMICALS

RECOVERED BY CARBON FILTER TECHNIQUE

RESULTS IN MICROGRAMS PER LITER
(Parts per billion)

STATE INDIANA

MAJOR BASIN OHIO RIVER

MINOR BASIN WABASH RIVER

STATION LOCATION WABASH RIVER AT
NEW HARMONY, INDIANA 105

DATE OF SAMPLE					GALLONS FILTERED	EXTRACTABLES			CHLOROFORM EXTRACTABLES									
BEGINNING			END								NEUTRALS							
MONTH	DAY	YEAR	MONTH	DAY		TOTAL	CHLOROFORM	ALCOHOL	ETHER INSOLUBLES	WATER SOLUBLES	TOTAL	ALIPHATICS	AROMATICS	OXYGENATED COMPOUNDS	LOSS	WEAK ACIDS	STRONG ACIDS	BASES	LOSS
10	19	62	10	27	5261	158	33	125	0	7	16	2	1	13	0	4	1	1	4
11	3	62	11	10	4519	160	25	135	0	7	9	1	1	7	0	3	1	1	4
12	8	62			598*	–	–	–	–	–	–	–	–	–	–	–	–	–	–
5	17	63	5	27	5122	122	50	72	2	13	14	1	1	12	0	6	4	1	10
6	3	63	6	11	5074	102	34	68	1	7	15	2	1	12	0	5	2	1	3
7	10	63	7	18	5264	147	59	88	1	16	18	0	1	15	2	6	8	1	9
7	30	63	8	7	4752	110	47	63	–	–	–	–	–	–	–	–	–	–	–
9	2	63	9	9	3703	158	61	97	2	15	21	1	1	19	0	9	5	1	8

* LOW FLOW

CHEMICAL, PHYSICAL AND BACTERIOLOGICAL ANALYSES

STATE INDIANA

MAJOR BASIN OHIO RIVER

MINOR BASIN WABASH RIVER

STATION LOCATION WABASH RIVER AT NEW HARMONY, INDIANA 105

DATE OF SAMPLE			TEMP. (Degrees Centigrade)	DISSOLVED OXYGEN mg/l	pH	B.O.D. mg/l	C.O.D. mg/l	CHLORINE DEMAND		AMMONIA-NITROGEN mg/l	CHLORIDES mg/l	ALKALINITY mg/l	HARDNESS mg/l	COLOR (cobalt units)	TURBIDITY (silica units)	SULFATES mg/l	PHOSPHATES mg/l	TOTAL DISSOLVED SOLIDS mg/l	COLIFORMS per 100 ml.
MONTH	DAY	YEAR						1-HOUR mg/l	24-HOUR mg/l										
10	1	62	18.0	11.0	8.3	1.1	-	-	-	-	18	171	238	15	100	55	.2	203	-
10	16	62	22.0	8.0	8.2	1.6	-	-	-	-	21	204	276	10	40	75	.3	387	3500
10	29	62	12.0	10.8	8.4	6.1	-	-	-	-	23	212	308	10	30	80	.3	387	3200
11	13	62	8.0	11.0	8.4	13.0	-	-	-	-	24	229	310	5	75	98	.6	440	2700
11	27	62	7.0	13.5	-	4.8	-	-	-	-	29	238	314	10	30	80	.4	419	3400
12	10	62	.0	12.8	8.3	2.8	-	-	-	-	-	-	324	10	5	79	.6	410	300
12	26	62	1.0	11.0	8.0	3.5	-	-	-	-	46	230	352	20	10	138	.3	-	5000
1	7	63	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1300
1	10	63	.0	16.5	7.8	4.1	-	-	-	-	40	200	284	20	10	124	.5	414	-
2	19	63	.0	-	7.8	-	-	-	-	-	34	196	272	20	5	66	1.0	-	-
3	5	63	2.0	6.7	7.9	5.0	-	-	-	-	33	138	210	15	480	64	1.0	-	10000
3	19	63	9.0	9.0	7.5	2.3	-	-	-	-	9	86	138	10	100	45	.4	230	9300
4	1	63	13.0	7.6	7.7	2.0	-	-	-	-	12	128	192	20	50	26	.8	259	8800
4	15	63	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3700
4	29	63	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	37000
6	10	63	29.0	6.8	8.2	2.9	-	-	-	-	21	168	230	15	70	74	.3	450	-
6	24	63	25.0	10.7	8.6	5.9	-	-	-	-	24	180	260	20	70	87	.4	380	3000
7	8	63	27.0	9.8	8.6	6.7	-	-	-	-	20	168	236	10	30	62	.5	336	2000
7	22	63	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2000
7	26	63	25.0	4.9	7.8	3.6	-	-	-	-	26	136	232	10	50	45	.8	325	-
8	6	63	-	-	8.5	5.9	-	-	-	-	21	148	214	15	40	73	.1	302	-
8	7	63	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
8	19	63	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	100
9	4	63	22.0	5.9	8.0	4.0	-	-	-	-	24	174	254	10	40	56	.3	430	60000
9	17	63	23.0	7.3	7.5	2.9	-	-	-	-	29	204	266	5	20	95	.2	389	-
																			2000

STREAM FLOW DATA - 1962-1963

Thousand Cubic Feet per Second

PROVISIONAL--SUBJECT TO REVISION

Gaging Station at Mount Carmel, Illinois
Operated by U.S. Geological Survey

STATE Indiana

MAJOR BASIN Ohio River

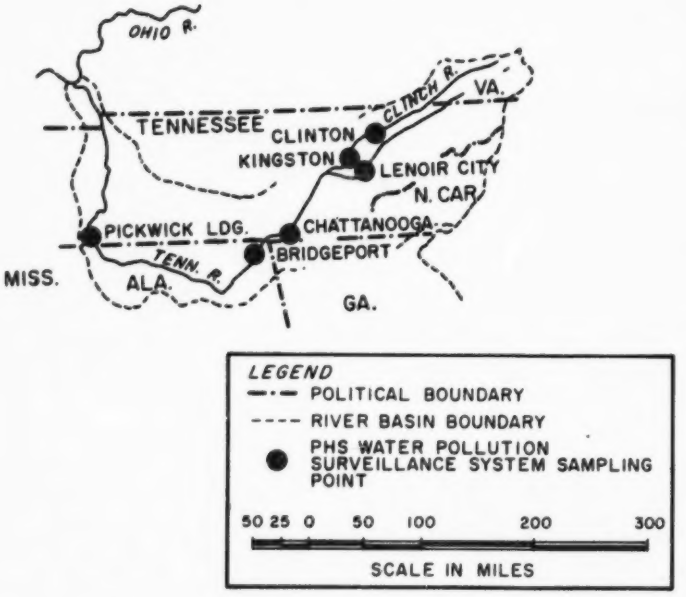
MINOR BASIN Wabash River

STATION LOCATION Wabash River at New Harmony, Indiana

Day	October	November	December	January	February	March	April	May	June	July	August	September
1	5.770	6.250	6.100	6.920	6.370	5.860	65.100	26.900	10.900	7.340	6.740	5.260
2	5.740	6.100	5.920	7.060	6.310	6.010	64.000	28.400	10.600	9.900	8.430	5.050
3	5.650	5.860	5.770	6.860	6.310	6.890	63.800	29.200	10.800	9.760	7.940	4.990
4	5.560	5.800	5.650	6.470	6.680	10.400	62.700	29.400	10.800	8.540	7.660	4.900
5	5.830	5.740	5.560	6.190	6.370	32.300	61.400	28.200	10.400	7.590	7.030	4.720
6	6.280	5.680	5.440	6.040	6.470	58.700	59.900	26.000	10.700	7.280	6.580	4.570
7	6.010	5.680	5.410	5.890	6.540	68.600	57.200	23.300	12.200	7.480	6.720	4.540
8	5.680	5.620	5.350	5.740	6.820	74.800	51.600	21.200	12.000	8.040	6.500	4.480
9	5.680	5.500	5.260	5.650	7.310	81.600	43.600	19.100	11.600	8.400	7.100	4.360
10	5.620	5.470	5.200	5.590	7.840	91.900	37.900	17.400	11.500	8.430	7.480	4.150
11	5.500	5.440	4.990	5.770	8.460	113.000	33.600	16.000	12.700	7.980	7.700	4.060
12	5.800	5.590	4.480	7.200	8.600	142.000	30.100	15.400	13.200	7.170	7.310	4.030
13	6.310	5.680	4.300	8.400	8.080	152.000	27.200	14.800	12.600	6.750	7.030	3.910
14	6.190	5.770	4.270	9.240	7.760	151.000	24.800	14.300	13.100	6.750	7.030	3.790
15	6.070	5.770	4.510	9.620	7.450	142.000	22.800	14.100	18.000	7.100	6.920	3.730
16	6.070	5.830	4.570	9.900	7.060	135.000	21.000	15.200	19.400	6.920	7.140	3.700
17	6.310	5.980	4.480	8.920	6.820	126.000	20.000	17.600	16.000	6.610	6.680	3.700
18	6.560	6.440	4.540	7.800	6.370	114.000	18.600	24.100	13.100	6.890	6.370	3.610
19	6.250	6.640	4.600	7.280	6.100	108.000	18.400	27.900	11.300	10.000	6.160	3.580
20	5.960	7.060	4.690	7.520	6.070	107.000	19.500	26.400	10.400	8.820	5.890	3.550
21	5.650	7.420	4.990	7.000	5.800	107.000	21.100	22.600	10.000	7.450	5.800	3.460
22	5.530	7.420	5.320	6.500	5.530	107.000	21.500	19.800	9.760	7.240	6.440	3.370
23	5.800	7.380	5.470	5.000	5.410	106.000	27.600	17.000	9.100	9.800	6.860	3.310
24	6.960	7.240	5.470	6.000	5.890	105.000	29.100	14.800	8.540	14.000	6.960	3.310
25	7.450	7.200	5.530	6.820	5.830	105.000	30.600	13.500	8.010	15.300	6.720	3.310
26	7.450	7.100	5.380	6.640	5.650	104.000	31.900	12.600	7.620	14.800	6.280	3.220
27	7.200	6.820	5.050	6.580	5.470	100.000	32.800	11.800	7.380	13.800	5.890	3.160
28	6.890	6.500	4.750	6.680	5.560	92.300	33.400	11.400	7.170	12.400	5.530	3.160
29	6.540	6.310	5.320	6.340		83.500	32.000	11.300	7.170	11.300	5.530	3.130
30	6.500	6.280	6.160	6.340		75.900	28.600	11.200	7.060	10.200	5.290	3.040
31	6.280		6.890	6.370		69.400		11.000		9.440	5.470	

BASIN 4

TENNESSEE RIVER



The Tennessee River is formed in eastern Tennessee by the junction of the Holston and French Broad Rivers. The stream flows southwesterly across the State, and westerly across northern Alabama for about 200 miles, and crosses Tennessee and the western tip of Kentucky to enter the Ohio River at Paducah. The total length is 652 miles. Surface water resources within the 40,910 square-mile basin have been developed by the Tennessee Valley Authority.

The Tennessee River basin contains six Public Health Service Water Pollution Surveillance System stations, four of which are located on the main stem and two on the Clinch River.

Climate in this basin is humid with an average precipitation of about 50 inches per year. Evaporation ranges from 30 to 40 inches per year. Average January temperatures vary from about 36° F. in the northeast to about 42° F. in the southwest. Corresponding July temperatures are about 72° and 80° F.

Stream valleys are deeply incised and a large number of reservoirs have consequently been constructed. These reservoirs on the Tennessee create quality problems which are unique.

Phytoplankton populations at stations in this basin are generally less than 1,000/milliliter except at Pickwick Landing on the Tennessee River and Kingston on the Clinch River. At these two stations summer pulses of the green algae, *Scenedesmus, Ankistrodesmus, Oocystis,* and *Tetradesmus* aid in producing total counts in excess of 5,000/ml. Centric diatoms are the dominant algae in the Tennessee River, but the algae of the Clinch River are dominated by pennate diatoms. The most abundant centric diatoms are *Melosira ambigua, M. distans* var. *alpigena, M. granulata, Stephanodiscus hantzschii,* and *Cyclotella pseudostelligera.* The more abundant pennate diatoms include *Diatoma vulgare, Navicula* spp., and *Achnanthes minutissima.* Rotifer populations of *Keratella, Polyarthra,* and *Synchaeta,* in the lower Tennessee River reach brief peaks of several hundred per liter during summer phytoplankton pulses.

Samples for benthic animals were taken on the Tennessee River at Pickwick Landing and at Lenoir City. Fish samples were taken at all stations in the basin except Pickwick Landing. Lists of the fish and preliminary findings from the benthos sampling program are presented with the station data.

CLINCH RIVER ABOVE KINGSTON, TENNESSEE

Samples are collected at the intake of the Oak Ridge Gaseous Diffusion Plant. This station is below TVA's Melton Hill Dam (closed in the summer of 1963) and is impounded by Watts Bar Reservoir, another TVA dam located approximately 50 miles downstream. The river at this point has reversing flows depending on the schedule of releases from these two dams.

The principal pollution sources are the city of Oak Ridge, Tennessee, population 25,000, with secondary treatment, and the Oak Ridge National Laboratory. Effluents from the Laboratory are impounded by a dam on White Oak Creek before release to the Clinch River.

The Asiatic clam, Corbicula fluminea, was common in bottom samples collected at this station in April and July 1963.

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Station Location: Clinch River above Kingston, Tennessee

Major Basin: Tennessee River

Minor Basin: Clinch River

Station at: 35°53' Latitude 84°20' Longitude

Miles above mouth: 14

Activation Date: January 31, 1962

Sampled by: Clinch River Study Commission

Field Analysis by: U.S. Public Health Service

Other Cooperating Agencies: Tennessee Department of Public Health
Tennessee Stream Pollution Control Commission

Hydrologic Data:

Nearest pertinent gaging station: Near Scarboro, Tennessee

Gaging station operated by: U.S. Geological Survey

Drainage area at gaging station: 3,300 square miles

Period of record: 1936 to present

Average discharge in record period: 4,612 cfs.

Maximum discharge in record period: 42,900 cfs.

Minimum discharge in record period: 111 cfs.

Remarks: Flows regulated by reservoir operations.

ALKYL BENZENE SULFONATE (ABS)

Date	mg/l

ELEMENTAL ANALYSES

		Composite Interval 10/1/62 to 12/31/62	Composite Interval 4/1/63 to 6/30/63
Analysis by wet or flame methods. Results in mg/l	F	*.01	.15
	Na	5.0	3.5
	K	2.2	1.0
Analysis by Spectrographic methods. Results in micrograms per liter	Zn	*2	55
	Cd	*1	*1
	As	*8	*10
	B	1	18
	P	*2	35
	Fe	16	56
	Mo	14	13
	Mn	*.4	6
	Al	—	85
	Be	*.02	*.03
	Cu	9	28
	Ag	*.2	*.3
	Ni	*1	4
	Co	*2	*1
	Pb	*2	
	Cr	*1	10
	V	*1	*5
	Ba	32	36
	Sr	68	36

*Actual value is less than the amount shown. Reported result indicates limit of sensitivity at which test was performed. See text for explanation.

STRONTIUM 90 ACTIVITY

Composite Interval	pc/l	±	Composite Interval	pc/l	±
October to December	—	—	April to June	5.6	.4
January to March	6.3	.5	July to September	9.4	.8

± at 95% Confidence Limits

SPECIFIC QUALITATIVE IDENTIFICATIONS FROM CARBON ADSORPTION EXTRACTS WATER YEAR 1962-3

Interval	Compound	Concentration* ug/l

*Concentration values, where shown, are calculated from quantitative gas chromatographic analysis of the aromatic fractions of CCE, and may be assigned the units of ug/l. In light of the unknown efficiency of carbon adsorption sampling for these compounds, the reported values represent minima, the actual values being equal to or greater than the reported values.
See page 21.

RADIOACTIVITY DETERMINATIONS

STATE TENNESSEE
MAJOR BASIN TENNESSEE RIVER
MINOR BASIN CLINCH RIVER
STATION LOCATION CLINCH RIVER ABOVE KINGSTON, TENNESSEE

106

DATE SAMPLE TAKEN			RADIOACTIVITY IN WATER														RADIOACTIVITY IN PLANKTON					
			DATE OF DETERMINATION		ALPHA						BETA						DATE OF DETERMINATION		GROSS ACTIVITY			
					SUSPENDED		DISSOLVED		TOTAL		SUSPENDED		DISSOLVED		TOTAL				ALPHA		BETA	
NO.	DAY	YR.	NO.	DAY	pc/l	±	pc/l	±	pc/l	±	pc/l	±	pc/l	±	pc/l	±	NO.	DAY	pc/g	±	pc/g	±
10	3	62	11	7	0	1	0	0	0	1	37	8	215	10	252	13						
10	10	62	12	27	0	0	0	1	0	1	11	6	320	13	331	14						
10	17	62	11	29	0	0	0	1	0	1	9	5	62	8	71	9						
1	8	63	1	30	0	1	0	1	0	1	20	7	187	10	207	12						
1	14	63	3	11	1	1	0	1	1	1	88	4	729	9	817	10						
1	21	63	3	11	1	1	2	1	3	1	226	5	3395	18	3621	19						
1	28	63	3	11	1	1	1	1	2	1	87	4	534	8	621	9						
2	4	63	3	11	3	2	0	1	3	2	621	10	1514	12	2135	16						
2	11	63	3	11	0	0	0	0	0	0	5	3	295	6	300	7						
2	18	63	3	11	6	4	1	1	7	4	130	7	95	4	225	8						
2	25	63	3	27	0	1	0	1	0	1	10	5	334	10	344	11						
3	4	63	3	27	0	1	1	1	1	1	16	6	360	13	376	14						
3	11	63	4	8	3	4	1	1	4	4	460	16	84	4	544	16						
3	18	63	4	8	4	2	1	1	5	2	86	6	39	4	125	7						
3	25	63	4	10	1	1	1	1	2	1	40	9	44	8	84	12						
4	1	63	4	29	1	1	0	1	1	1	122	5	279	6	401	8						
4	8	63	4	25	0	1	0	1	0	1	36	7	353	13	389	15						
4	15	63	5	1	5	2	0	1	5	2	382	15	482	16	864	22						
4	23	63	5	6	0	0	0	1	0	1	57	4	96	4	153	6						
4	29	63	5	15	0	1	0	0	0	1	17	6	63	8	80	10						
5	6	63	5	20	0	1	2	1	2	1	67	4	727	9	794	10						
5	13	63	6	7	1	1	2	1	3	1	31	3	283	6	314	7						
5	20	63	6	13	0	1	1	1	1	1	12	6	91	9	103	11						
5	27	63	6	12	2	1	0	1	2	1	98	10	83	9	181	13						
6	3	63	6	17	0	1	0	1	0	1	15	3	114	5	129	6						
6	10	63	6	24	4	2	0	1	4	2	128	8	58	4	186	9						
6	17	63	7	3	2	2	0	2	2	3	174	13	455	16	629	21						
6	24	63	7	10	0	1	1	1	1	1	22	7	104	9	126	11						
7	1	63	7	17	0	1	3	1	3	1	3	10	146	10	149	14						
7	10	63	7	31	0	1	0	1	0	1	30	6	161	10	191	12						
7	15	63	7	31	1	1	0	1	1	1	17	6	226	11	243	13						
7	22	63	8	7	0	1	4	2	4	2	18	7	93	9	111	11						
7	29	63	8	14	0	1	3	1	3	1	24	6	197	11	221	13						
8	5	63	8	16	1	1	0	1	1	1	26	6	131	10	157	12						
8	12	63	8	27	1	1	1	1	2	1	66	8	456	15	522	17						
8	19	63	9	9	0	0	1	1	1	1	17	7	77	8	94	11						
8	26	63	9	16	0	1	1	1	1	1	6	3	63	4	69	5						
9	4	63	9	20	0	0	0	0	0	0	6	4	23	6	29	7						
9	9	63	10	1	0	1	0	0	0	1	9	3	57	5	66	6						
9	16	63	10	8	0	1	0	1	0	1	4	6	45	8	49	10						

PLANKTON POPULATION

STATE TENNESSEE
MAJOR BASIN TENNESSEE RIVER
MINOR BASIN CLINCH RIVER
STATION LOCATION CLINCH RIVER ABOVE KINGSTON, TENNESSEE

106

DATE OF SAMPLE			DOMINANT SPECIES OF DIATOMS AND PERCENT OF TOTAL DIATOMS (See text for Codes)									FUNGI AND SHEATHED BACTERIA (Number per ml.)	MICROINVERTEBRATES																													
			1ST		2ND		3RD		4TH				PROTOZOA (Identifiable) (Number per ml.)	ROTIFERS													CRUSTACEA												NEMATODES (Identifiable) (Number per liter)	OTHER AERIAL FORMS (Number per liter)
														NUMBER PER LITER	GENERA AND COUNT LEVEL (See text for Codes)												NUMBER PER LITER	GENERA AND COUNT LEVEL (See text for Codes)													
															1ST		2ND		3RD		4TH		5TH				1ST		2ND		3RD									
MONTH	DAY	YEAR	SPECIES	PERCENT	SPECIES	PERCENT	SPECIES	PERCENT	SPECIES	PERCENT	OTHER SPECIES PERCENT				GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL			GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL								
10	1	62	65	36	36	23	64	5	62	4	32	-	-	36	15	3									0												1	1
10	15	62	62	30	36	23	65	12	15	6	29	-	-	8											0												0	0
11	5	62	65	28	36	27	62	11	26	9	25	-	-	0											0												0	0
11	19	62	36	33	56	13	65	8	62	8	38	20	0	0											0												0	0
12	3	62	62	26	65	16	36	13	15	9	36	-	-	0											0												0	0
12	17	62	56	65	58	6	36	6	62	5	18	-	-	0											0												0	0
1	7	63	36	18	56	15	65	14	62	10	43	-	-	0											0												0	0
1	28	63	36	30	56	17	65	14	62	9	30	-	-	-											-												-	-
2	4	63										-	-	0											0												0	0
2	18	63										-	-	-											-												-	-
3	4	63	36	15	82	14	65	13	71	8	50	-	-	0											1												0	0
3	18	63	36	50	65	23	15	6	92	5	16	-	-	0											0												0	0
4	1	63	65	40	36	22	15	3	16	2	33	-	-	0											0												0	0
5	20	63	91	42	82	18	56	5	27	5	30	-	-	-											-												-	-
6	3	63	9	59	56	20	58	9	65	4	8	-	-	-											-												-	-
6	17	63	47	46	61	9	2	7	52	7	31	-	-	-											-												-	-
7	1	63	58	44	56	22	26	6	82	5	23	-	-	-											-												-	-
7	15	63	82	32	91	13	36	9	56	9	37	-	-	-											-												-	-
8	5	63	91	31	58	8	65	6	36	4	51	-	-	-											-												-	-
8	19	63	2	65	91	15	27	6	56	3	11	-	-	-											-												-	-
9	4	63	3	94	36	1	91	1			4	-	-	-											-												-	-
9	16	63	3	69	91	8	56	7	27	3	13	-	-	-											-												-	-

PLANKTON POPULATION

STATE TENNESSEE

MAJOR BASIN TENNESSEE RIVER

MINOR BASIN CLINCH RIVER

STATION LOCATION CLINCH RIVER ABOVE KINGSTON, TENNESSEE 106

DATE OF SAMPLE			ALGAE (Number per milliliter)										INERT DIATOM SHELLS		MOST ABUNDANT ALGAE - Genera and Count Level per ml. (See text for Codes)																	
			TOTAL	BLUE-GREEN		GREEN		FLAGELLATED (Pigmented)		DIATOMS					1ST		2ND		3RD		4TH		5TH		6TH		7TH		8TH		9TH		10TH	
MONTH	DAY	YEAR		COCCOID	FILAMENTOUS	COCCOID	FILAMENTOUS	GREEN	OTHER	CENTRIC	PENNATE	CENTRIC	PENNATE	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL
10	1	62	300	0	0	20	0	10	0	40	250	110	460																			
10	15	62	3800	0	0	100	0	80	60	410	3170	80	660	82	3	87	3	89	2	71	2	88	1									
11	5	62	1700	0	0	170	0	0	170	210	1120	80	210	87	2	82	2	69	1	44	1	60	1									
11	19	62	1800	0	0	100	0	20	80	210	1370	0	170	82	3	87	2															
12	3	62	300	0	0	0	0	20	0	90	200	90	440																			
12	17	62	300	0	0	0	0	0	0	200	70	110	240	71	1																	
1	7	63	1200	0	0	0	0	0	0	640	550	510	1800	87	1	68	1	71	1													
1	28	63	400	0	0	0	0	0	0	150	260	200	1060	71	1																	
2	4	63	100	0	0	0	0	0	0	0	110	20	260																			
2	18	63	1100	0	20	20	0	0	0	40	1030	90	2840																			
3	4	63	2900	0	0	0	0	0	90	20	180	0	130																			
3	18	63	600	0	0	0	0	20	0	150	420	20	950	82	1																	
4	1	63	700	0	0	0	0	20	230	80	320	80	440	65	1																	
5	20	63	2400	0	130	110	0	130	420	230	1390	150	170	92	3	61	1															
6	3	63	1600	0	20	110	0	20	380	230	880	110	340	77	3	63	2															
6	17	63	900	0	0	110	0	40	20	310	420	70	750	69	1	77	1															
7	1	63	800	0	0	80	0	20	0	560	150	100	40	69	2																	
7	15	63	300	0	0	40	0	0	40	0	220	40	0																			
8	5	63	800	0	0	120	0	60	0	40	620	60	770	92	1																	
8	19	63	5100	50	50	390	0	790	30	490	3300	270	1060	73	5	92	2	51	2	68	1	44	1	69	1							
9	4	63	5200	0	70	200	0	20	40	460	4440	1390	700	73	5	69	2															
9	16	63	1500	0	0	140	0	70	0	90	1240	140	1810	73	3																	

ORGANIC CHEMICALS

RECOVERED BY CARBON FILTER TECHNIQUE

RESULTS IN MICROGRAMS PER LITER
(Parts per billion)

STATE TENNESSEE

MAJOR BASIN TENNESSEE RIVER

MINOR BASIN CLINCH RIVER

STATION LOCATION CLINCH RIVER ABOVE KINGSTON, TENNESSEE

DATE OF SAMPLE BEGINNING			DATE OF SAMPLE END		GALLONS FILTERED	EXTRACTABLES			CHLOROFORM EXTRACTABLES										
											NEUTRALS								
MONTH	DAY	YEAR	MONTH	DAY		TOTAL	CHLORO-FORM	ALCOHOL	ETHER INSOLUBLES	WATER SOLUBLES	TOTAL	ALIPHATICS	AROMATICS	OXYGEN-ATED COMPOUNDS	LOSS	WEAK ACIDS	STRONG ACIDS	BASES	LOSS
10	5	62	10	17	4793	117	25	92	0	6	9	1	1	7	0	3	1	0	6
11	1	62	11	15	6454	193	42	151	1	11	10	1	1	8	0	5	6	1	8
11	29	62	12	19	6049	189	39	150	2	4	13	1	1	10	1	6	6	1	7
1	2	63	1	14	2270	445	64	381	3	17	16	1	1	14	0	8	6	1	13
2	1	63	2	18	6628	201	50	151	4	15	10	2	1	7	0	5	2	1	13
3	4	63	3	22	776*	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4	1	63	4	11	5030	105	34	71	1	9	9	1	1	6	1	4	4	0	7
5	1	63	6	2	719*	-	-	-	-	-	-	-	-	-	-	-	-	-	-
6	2	63	7	1	*	-	-	-	-	-	-	-	-	-	-	-	-	-	-
7	1	63	7	9	6400	103	44	59	0	16	11	1	1	8	1	5	4	1	7
8	2	63	8	26	4300	116	44	72	1	13	13	1	1	10	1	6	3	1	7
9	1	63	9	9	6710	79	38	41	1	13	10	1	2	7	0	5	4	0	5

* LOW FLOW

* FLOW UNKNOWN

CHEMICAL, PHYSICAL AND BACTERIOLOGICAL ANALYSES

STATE TENNESSEE

MAJOR BASIN TENNESSEE RIVER

MINOR BASIN CLINCH RIVER

STATION LOCATION CLINCH RIVER ABOVE KINGSTON, TENNESSEE

106

DATE OF SAMPLE			TEMP. (Degrees Centigrade)	DISSOLVED OXYGEN mg/l	pH	B.O.D. mg/l	C.O.D. mg/l	CHLORINE DEMAND		AMMONIA-NITROGEN mg/l	CHLORIDES mg/l	ALKALINITY mg/l	HARDNESS mg/l	COLOR (cobalt units)	TURBIDITY (silica units)	SULFATES mg/l	PHOSPHATES mg/l	TOTAL DISSOLVED SOLIDS mg/l	COLIFORMS per 100 ml.
MONTH	DAY	YEAR						1-HOUR mg/l	24-HOUR mg/l										
10	1	62	-	-	8.0	-	-	-	-	-	4	104	112	0	*25	13	.0	150	-
10	8	62	-	-	7.7	-	-	-	-	-	12	102	116	0	*25	17	.0	146	-
10	15	62	-	-	8.1	-	-	-	-	-	4	108	112	0	*25	11	.0	132	-
10	22	62	-	-	8.2	-	-	-	-	-	3	104	124	0	*25	14	.0	134	-
10	29	62	-	-	8.0	-	-	-	-	-	3	100	108	0	*25	19	.0	128	-
11	5	62	-	-	7.8	-	-	-	-	-	5	86	96	0	*25	10	.0	117	-
11	12	62	-	-	7.7	-	-	-	-	-	4	88	92	0	*25	14	.0	120	-
11	19	62	-	-	7.9	-	-	-	-	-	5	92	108	5	*25	17	.0	130	-
11	26	62	-	-	7.9	-	-	-	-	-	4	92	100	0	*25	14	.0	137	-
12	3	62	-	-	7.9	-	-	-	-	-	6	96	136	0	*25	15	.0	142	-
12	17	62	-	-	7.7	-	-	-	-	-	3	100	108	0	*25	16	.0	126	-
1	8	63	-	-	8.0	-	-	-	-	-	3	102	116	-	*25	16	.0	135	-
2	25	63	-	-	7.9	-	-	-	-	-	4	96	110	5	*25	13	.0	167	-
3	4	63	-	-	8.0	-	-	-	-	-	3	100	120	0	*25	12	.0	121	-
3	11	63	-	-	7.2	-	-	-	-	-	4	100	116	0	380	15	.0	156	-
3	18	63	-	-	7.3	-	-	-	-	-	3	96	108	0	170	11	.0	134	-
3	25	63	-	-	7.3	-	-	-	-	-	5	88	100	0	35	13	.0	150	-
4	1	63	-	-	7.7	-	-	-	-	-	6	88	96	0	*25	11	.0	115	-
4	8	63	-	-	7.8	-	-	-	-	-	7	92	100	0	*25	12	.0	113	-
4	15	63	-	-	7.5	-	-	-	-	-	3	108	112	0	*25	11	.0	114	-
4	23	63	-	-	7.2	-	-	-	-	-	3	84	120	5	*25	13	.0	115	-
4	29	63	-	-	-	-	-	-	-	-	3	80	88	0	*25	13	.0	105	-
5	6	63	-	-	-	-	-	-	-	-	8	72	104	5	120	18	.0	116	-
5	15	63	-	-	-	-	-	-	-	-	6	56	68	10	*25	20	.0	103	-
5	20	63	-	-	-	-	-	-	-	-	6	88	92	0	*25	14	.0	112	-
5	27	63	-	-	-	-	-	-	-	-	4	88	108	5	*25	14	.0	101	-
6	3	63	-	-	-	-	-	-	-	-	3	88	92	0	*25	14	.0	111	-
6	10	63	-	-	-	-	-	-	-	-	6	78	92	5	*25	11	.0	106	-
6	17	63	-	-	-	-	-	-	-	-	6	78	100	5	*25	12	.0	136	-
6	24	63	-	-	-	-	-	-	-	-	4	78	92	5	*25	13	.0	129	-
7	1	63	-	-	-	-	-	-	-	-	5	70	96	5	*25	18	.0	103	-
7	10	63	-	-	-	-	-	-	-	-	4	82	136	0	*25	12	.0	126	-
7	15	63	-	-	-	-	-	-	-	-	3	78	100	0	*25	16	.0	113	-
7	22	63	-	-	-	-	-	-	-	-	5	74	96	0	60	23	.0	119	-
7	29	63	-	-	-	-	-	-	-	-	5	68	100	0	*25	20	.0	102	-
8	5	63	-	-	-	-	-	-	-	-	4	78	92	0	*25	13	.0	103	-
8	12	63	-	-	-	-	-	-	-	-	6	78	90	5	*25	14	.0	108	-
8	19	63	-	-	-	-	-	-	-	-	5	82	90	0	*25	15	.0	112	-
8	26	63	-	-	-	-	-	-	-	-	10	82	98	0	*25	10	.0	108	-

CHEMICAL, PHYSICAL AND BACTERIOLOGICAL ANALYSES

STATE TENNESSEE

MAJOR BASIN TENNESSEE RIVER

MINOR BASIN CLINCH RIVER

STATION LOCATION CLINCH RIVER ABOVE KINGSTON, TENNESSEE

106

DATE OF SAMPLE			TEMP. (Degrees Centigrade)	DISSOLVED OXYGEN mg/l	pH	B.O.D. mg/l	C.O.D. mg/l	CHLORINE DEMAND		AMMONIA-NITROGEN mg/l	CHLORIDES mg/l	ALKALINITY mg/l	HARDNESS mg/l	COLOR (scale units)	TURBIDITY (scale units)	SULFATES mg/l	PHOSPHATES mg/l	TOTAL DISSOLVED SOLIDS mg/l	COLIFORMS per 100 ml.
MONTH	DAY	YEAR						1-HOUR mg/l	24-HOUR mg/l										
9	4	63	-	-	-	-	-	-	-	-	9	78	92	0	*25	15	.0	108	-
9	9	63	-	-	-	-	-	-	-	-	9	78	92	0	*25	14	.0	-	-
9	16	63	-	-	-	-	-	-	-	-	3	90	96	0	*25	13	.0	108	-
9	23	63	-	-	-	-	-	-	-	-	3	82	88	0	*25	13	.0	114	-

STREAM FLOW DATA - 1962-1963

Thousand Cubic Feet per Second

PROVISIONAL--SUBJECT TO REVISION

Gaging Station at Melton Hill Dam, Tennessee
Operated by U.S. Geological Survey

STATE: Tennessee

MAJOR BASIN: Tennessee River

MINOR BASIN: Clinch River

STATION LOCATION: Clinch River above Kingston, Tennessee

Day	October	November	December	January	February	March	April	May	June	July	August	September
1	4.370	3.860	5.800	1.420	2.610	3.690	.674	.870	3.260	4.060	2.440	1.000
2	5.650	4.140	6.230	1.120	2.350	2.090	.560	-	3.290	8.020	-	1.000
3	5.980	4.330	6.180	4.980	2.170	.988	.508	-	3.430	4.680	-	4.900
4	2.540	4.540	6.890	5.530	2.040	.688	.471	-	6.660	-	-	7.290
5	1.320	4.410	7.570	2.420	1.490	1.760	.422	.125	10.900	.663	4.740	8.030
6	2.760	4.740	7.860	2.870	1.380	9.960	.409	1.680	10.200	2.010	4.720	5.320
7	2.770	4.950	7.860	5.100	1.140	9.800	.435	1.960	6.530	2.010	4.710	.994
8	3.500	5.090	7.700	6.040	3.420	11.100	.402	.065	5.180	2.010	4.270	1.010
9	3.510	5.410	7.650	6.080	7.540	10.500	.376	.290	6.800	2.990	1.230	5.040
10	3.650	6.420	7.610	7.030	7.200	9.930	.370	-	8.100	4.160	-	8.200
11	3.520	2.640	7.610	7.540	7.480	8.330	.320	-	8.800	3.390	-	8.870
12	3.420	1.060	7.540	7.850	8.430	22.200	.320	-	8.010	1.970	4.800	9.310
13	3.300	.572	7.570	3.820	8.400	22.700	.311	-	7.940	1.990	4.790	6.460
14	3.300	.383	7.610	2.940	8.380	18.900	.311	.225	4.960	2.010	4.770	1.970
15	3.390	.560	7.530	4.820	8.330	25.600	.316	.225	-	4.170	4.750	2.010
16	3.860	1.130	7.370	5.230	8.260	27.400	.321	.297	.846	6.700	-	6.420
17	3.960	2.060	7.340	7.320	8.190	27.600	1.760	2.300	4.210	6.070	-	8.130
18	3.880	2.070	6.580	5.150	8.160	28.100	7.340	3.960	5.030	5.350	-	8.040
19	3.860	1.220	5.620	2.810	8.230	27.500	8.160	3.260	7.760	3.340	4.810	7.990
20	3.980	.910	5.510	1.670	4.400	28.300	8.530	.464	8.150	-	4.800	5.610
21	4.410	1.680	6.300	1.580	2.030	27.600	6.890	2.140	3.290	-	4.770	1.990
22	3.880	2.270	7.360	2.520	6.460	27.100	5.430	2.140	-	-	4.710	2.020
23	3.640	3.650	5.520	1.160	5.520	26.500	8.260	.712	-	-	4.690	8.390
24	3.270	2.690	2.130	3.280	4.960	26.300	8.430	1.070	-	3.020	-	10.900
25	3.050	2.050	3.290	5.150	1.850	26.200	8.380	2.160	-	3.000	-	9.660
26	3.030	1.670	2.040	1.850	1.940	26.000	8.360	2.310	1.500	.994	4.780	7.810
27	3.220	1.220	3.500	1.100	5.520	21.400	8.330	.250	2.970	.621	4.770	5.210
28	3.990	2.500	1.420	5.450	3.420	14.500	7.530	.337	1.230	-	4.750	.986
29	4.140	2.680	1.310	6.870		10.100	5.520	-	-	2.960	4.440	1.000
30	4.040	4.150	1.820	5.520		4.850	3.280	3.320	-	4.180	1.970	6.160
31	3.940		1.530	2.110		1.240		4.300		4.190	1.290	

FISH POPULATION

State: Tennessee
Major basin: Tennessee River
Minor basin: Clinch River
Station location: Clinch River above Kingston, Tenn.

		Collecting method											
		Rotenone						Electric shocker					
Sampling date(s)		July 30, 1963						July 31 and Aug. 1, 1963					
Total number of fish		498						2,114					
Total weight of fish (pounds)		126.9						93.6					
Group	Species collected	Percent of total		Length range (inches) number of fish				Percent of total		Length range (inches) number of fish			
		Number	Weight	0–4	5–8	9–12	Over 12	Number	Weight	0–4	5–8	9–12	Over 12
I	Longnose gar	0.4	<0.1	.....	2	.....	.....	.....	.....	.....	.....	.....	.....
	Skipjack	.2	.5	.....	.....	.....	1	.....	.....	.....	.....	.....	.....
	White bass	.4	<.1	2	.....	.....	.....	0.2	1.2	.....	.....	.....	.....
	Largemouth bass	2.0	2.6	3	3	2	2	2.4	12.1	.....	.....	.....	.....
	Spotted bass	.....	.....	.....	.....	.....	.....	.6	5.0	.....	.....	.....	.....
	Smallmouth bass	.....	.....	.....	.....	.....	.....	<.1	.2	.....	.....	.....	.....
	White crappie	4.0	2.3	14	.....	6	.....	2.8	9.1	.....	.....	.....	.....
	Sauger	.4	.1	.....	2	.....	.....	.1	.3	.....	.....	.....	.....
	Walleye	.....	.....	.....	.....	.....	.....	.1	<.1	.....	.....	.....	.....
		7.4	5.5	.....	.....	.....	.....	6.2	27.9	.....	.....	.....	.....
II	Emerald shiner	7.0	.1	35	.....	.....	.....	1.8	.2	.....	.....	.....	.....
	Common shiner	10.6	.1	53	.....	.....	.....	.....	.....	.....	.....	.....	.....
	Spotfin shiner	1.0	<.1	5	.....	.....	.....	.9	.1	.....	.....	.....	.....
	Bullhead minnow	7.6	.1	38	.....	.....	.....	.8	<.1	.....	.....	.....	.....
	Hogsucker	.....	.....	.....	.....	.....	.....	<.1	.1	.....	.....	.....	.....
	Rock bass	.....	.....	.....	.....	.....	.....	<.1	<.1	.....	.....	.....	.....
	Warmouth	.2	.1	1	.....	.....	.....	.2	.5	.....	.....	.....	.....
	Bluegill	6.0	2.0	20	10	.....	.....	3.0	4.2	.....	.....	.....	.....
	Redear sunfish	.....	.....	.....	.....	.....	.....	.7	.9	.....	.....	.....	.....
	Logperch	.....	.....	.....	.....	.....	.....	.7	.1	.....	.....	.....	.....
	Brook silversides	.....	.....	.....	.....	.....	.....	.2	<.1	.....	.....	.....	.....
		32.4	2.4	.....	.....	.....	.....	8.3	6.1	.....	.....	.....	.....

FISH POPULATION—Continued

State: Tennessee
Major basin: Tennessee River
Minor basin: Clinch River
Station location: Clinch River above Kingston, Tenn.

Group	Species collected	Collecting method: Rotenone — Percent of total: Number	Rotenone — Percent of total: Weight	Rotenone — Length range (inches) number of fish: 0–4	5–8	9–12	Over 12	Electric shocker — Percent of total: Number	Electric shocker — Percent of total: Weight	Electric shocker — Length range (inches) number of fish: 0–4	5–8	9–12	Over 12
Sampling date(s)		July 30, 1963						July 31 and Aug 1, 1963					
Total number of fish		498						2,114					
Total weight of fish (pounds)		126.9						93.6					
III	Gizzard shad	17.4	4.0	75	.....	10	.....	40.4	14.6	.....	.....	.....	.....
	Threadfin shad	7.8	.1	39	.....	.....	.....	42.8	3.2	.....	.....	.....	.....
		25.2	4.1	.....	.....	.....	.....	83.2	17.8	.....	.....	.....	.....
IV	Black redhorse	7.8	10.4	6	19	9	5	.....	.....	.....	.....	.....	.....
	Golden redhorse	3.8	.8	19	.....	.....	.....	.8	2.0	.....	.....	.....	.....
	Freshwater drum	4.8	2.7	3	16	5	.....	.5	.6	.....	.....	.....	.....
		16.4	13.9	.....	.....	.....	.....	1.3	2.6	.....	.....	.....	.....
V	River carpsucker	1.2	16.6	.....	.....	.....	6	.....	.....	.....	.....	.....	.....
	Quillback carpsucker	11.0	.2	55	.....	.....	.....	.2	4.2	.....	.....	.....	.....
		12.2	16.8	.....	.....	.....	.....	.2	4.2	.....	.....	.....	.....
VI	Carp	2.6	22.8	.....	.....	.....	13	.5	21.9	.....	.....	.....	.....
	Smallmouth buffalo	3.8	34.5	.....	.....	.....	19	.1	4.9	.....	.....	.....	.....
	Black buffalo	.....	.....	.....	.....	.....	.....	.2	14.6	.....	.....	.....	.....
		6.4	57.3	.....	.....	.....	.....	.8	41.4	.....	.....	.....	.....

CLINCH RIVER AT CLINTON, TENNESSEE

This is the uppermost station on the Tennessee River System, and is in the tailwaters of TVA's Norris Dam located approximately 10 river miles above the sampling point. The station lies at about the upper limit of the main arm of the impoundment created by Melton Hill Dam which was completed in the early summer of 1963. Samples are collected from the intake of the municipal water treatment plant located at State Highway 61 Bridge.

The river serves as a water supply for several small communities in the area including Clinton and Andersonville, Tennessee.

The discharge from Norris creates a coldwater habitat and an important tailwater trout fishery has developed as a result of trout stocking by the Tennessee Department of Fish and Game.

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Station Location:	Clinch River at Clinton, Tennessee
Major Basin:	Tennessee River
Minor Basin:	Clinch River
Station at:	36°07' Latitude 84°07' Longitude
Miles above mouth:	68
Activation Date:	June 18, 1962
Sampled by:	Clinton Water Department
Field Analysis by:	Clinton Water Department U.S. Public Health Service
Other Cooperating Agencies:	Tennessee Department of Public Health
Hydrologic Data:	
Nearest pertinent gaging station:	Clinch River below Norris Dam
Gaging station operated by:	U.S. Geological Survey
Drainage area at gaging station:	2,913 square miles
Period of record:	1903 to present
Average discharge in record period:	4,326 cfs.

Maximum discharge in record period: 87,000 cfs.

Minimum discharge in record period: 1.3 cfs. (daily)

Remarks: Operation of Norris Dam completely regulates the Clinch River at this point.

ALKYL BENZENE SULFONATE (ABS)

Date	mg/l

ELEMENTAL ANALYSES

		Composite Interval 10/1/62 to 12/31/62	Composite Interval 4/1/63 to 6/30/63
Analysis by wet or flame methods. Results in mg/l	F	.10	.15
	Na	3.0	4.9
	K	2.2	1.2
Analysis by Spectrographic methods. Results in micrograms per liter	Zn	*2	15
	Cd	*1	*2
	As	*12	*19
	B	44	20
	P	*3	*10
	Fe	52	8
	Mo	*2	10
	Mn	*.6	6
	Al	—	37
	Be	*.03	*.05
	Cu	5	17
	Ag	*.2	*.5
	Ni	*1	*2
	Co	*2	*2
	Pb	*3	14
	Cr	*1	*5
	V	*1	*10
	Ba	30	31
	Sr	70	48

*Actual value is less than the amount shown. Reported result indicates limit of sensitivity at which test was performed. See text for explanation.

STRONTIUM 90 ACTIVITY

Composite Interval	pc/l	±	Composite Interval	pc/l	±
October to December	1.0	.2	April to June	—	—
January to March	—	—	July to September	1.4	.3

± at 95% Confidence Limits

SPECIFIC QUALITATIVE IDENTIFICATIONS FROM CARBON ADSORPTION EXTRACTS WATER YEAR 1962-3

Interval	Compound	Concentration* ug/l

*Concentration values, where shown, are calculated from quantitative gas chromatographic analysis of the aromatic fractions of CCE, and may be assigned the units of ug/l. In light of the unknown efficiency of carbon adsorption sampling for these compounds, the reported values represent minima, the actual values being equal to or greater than the reported values.

See page 21.

RADIOACTIVITY DETERMINATIONS

STATE TENNESSEE

MAJOR BASIN TENNESSEE RIVER

MINOR BASIN CLINCH RIVER

STATION LOCATION CLINCH RIVER AT CLINTON, TENNESSEE

119

DATE SAMPLE TAKEN			RADIOACTIVITY IN WATER														RADIOACTIVITY IN PLANKTON					
			DATE OF DETERMINATION		ALPHA						BETA						DATE OF DETERMINATION		GROSS ACTIVITY			
					SUSPENDED		DISSOLVED		TOTAL		SUSPENDED		DISSOLVED		TOTAL				ALPHA		BETA	
MO.	DAY	YR.	MO.	DAY	pc/l	±	pc/l	±	pc/l	±	pc/l	±	pc/l	±	pc/l	±	MO.	DAY	pc/g	±	pc/g	±
10	15	62	11	9	-	-	-	-	-	-	13	5	11	7	24	9						
10	22	62	11	9	0	0	0	0	0	0	3	5	4	6	7	8						
10	29	62	11	21	0	1	1	2	1	2	16	6	23	9	39	11						
11	5	62	11	28	0	0	0	0	0	0	2	5	12	6	14	8						
11	12	62	12	4	0	1	1	1	1	1	12	7	25	7	37	10						
11	19	62	12	6	0	0	0	1	0	1	2	5	12	7	14	9						
11	26	62	12	17	0	0	0	0	0	0	1	5	17	6	18	7						
12	3	62	12	27	0	0	2	1	2	1	11	5	14	6	25	8						
12	10	62	1	3	0	1	1	1	1	1	2	5	8	7	10	9						
12	17	62	1	4	0	1	1	1	1	1	5	6	18	7	23	9						
12	24	62	1	10	0	1	0	1	0	1	1	6	9	7	10	9						
1	7	63	1	18	0	1	0	1	0	1	2	6	14	7	16	9						
1	14	63	1	25	0	1	0	1	0	1	19	7	9	6	28	9						
1	21	63	2	1	0	0	0	0	0	0	13	6	14	6	27	8						
1	28	63	2	14	0	0	0	0	0	0	6	6	14	7	20	9						
2	4	63	2	19	2	1	0	1	2	1	24	8	14	7	38	11						
2	18	63	3	7	0	1	0	1	0	1	4	6	18	7	22	9						
3	4	63	3	22	0	0	0	0	0	0	5	6	22	7	27	9						
3	11	63	3	25	0	1	0	1	0	1	62	5	29	4	91	7						
3	18	63	4	1	1	1	7	2	8	2	22	3	32	4	54	5						
3	26	63	4	8	0	1	0	0	0	1	13	3	20	4	33	5						
4	1	63	4	18	0	0	0	1	0	1	4	6	14	7	18	9						
4	8	63	4	29	0	0	0	1	0	1	3	3	25	4	28	5						
4	15	63	5	6	0	1	0	1	0	1	3	3	17	3	20	4						
4	22	63	5	6	0	1	0	1	0	1	8	3	34	4	42	5						
4	30	63	5	15	0	1	1	1	1	1	66	7	44	8	110	11						
5	6	63	5	17	0	0	0	1	0	1	24	6	20	7	44	9						
5	13	63	5	24	0	0	1	1	1	1	4	5	13	6	17	8						
5	20	63	6	3	0	0	0	0	0	0	9	3	17	3	26	4						
5	27	63	6	12	0	1	0	1	0	1	16	6	20	7	36	9						
6	3	63	6	13	0	1	2	1	2	1	11	6	11	7	22	9						
6	10	63	6	24	1	1	0	1	1	1	8	3	8	3	16	4						
6	17	63	7	3	0	0	0	0	0	0	37	7	26	8	63	11						
6	25	63	7	10	0	0	0	0	0	0	8	6	15	7	23	9						
7	1	63	7	17	1	1	0	0	1	1	21	6	16	7	37	9						
7	8	63	7	23	1	1	0	1	1	1	26	5	19	6	45	8						
7	15	63	8	6	0	0	0	1	0	1	5	6	11	6	16	8						
7	22	63	8	12	0	1	0	0	0	1	6	3	10	3	16	4						
7	29	63	8	12	0	1	0	0	0	1	8	3	11	3	19	4						

RADIOACTIVITY DETERMINATIONS

STATE TENNESSEE

MAJOR BASIN TENNESSEE RIVER

MINOR BASIN CLINCH RIVER

STATION LOCATION CLINCH RIVER AT CLINTON, TENNESSEE

119

DATE SAMPLE TAKEN			RADIOACTIVITY IN WATER														RADIOACTIVITY IN PLANKTON					
			DATE OF DETERMINATION	ALPHA						BETA							DATE OF DETERMINATION	GROSS ACTIVITY				
				SUSPENDED		DISSOLVED		TOTAL		SUSPENDED		DISSOLVED		TOTAL				ALPHA		BETA		
MO.	DAY	YR.	MO.	DAY	pc/l	±	pc/l	±	pc/l	±	pc/l	±	pc/l	±	pc/l	±	MO.	DAY	pc/g	±	pc/g	±
8	5	63	8	19	0	0	0	0	0	0	5	3	10	3	15	4						
8	12	63	8	23	0	1	0	1	0	1	7	6	11	7	18	9						
8	19	63	9	6	0	0	0	1	0	1	3	6	6	7	9	9						
8	26	63	9	16	0	1	0	1	0	1	0	6	11	4	11	7						
9	3	63	9	17	0	1	1	1	1	1	4	6	9	8	13	10						
9	10	63	10	7	0	0	0	0	0	0	0	7	5	7	5	10						
9	16	63	10	10	0	0	0	0	0	0	2	5	4	7	6	9						
9	30	63	10	17	0	1	0	0	0	1	0	7	6	7	6	10						

STREAM FLOW DATA - 1962-1963

Thousand Cubic Feet per Second

PROVISIONAL--SUBJECT TO REVISION

Gaging Station below Norris Dam, Tennessee
Operated by U.S. Geological Survey

STATE: Tennessee

MAJOR BASIN: Tennessee River

MINOR BASIN: Clinch River

STATION LOCATION: Clinch River at Clinton, Tennessee

Day	October	November	December	January	February	March	April	May	June	July	August	September
1	5.800	3.970	6.180	.086	1.460	.958	.055	7.610	3.000	5.380	.090	.080
2	5.890	4.380	5.870	4.830	.078	.078	.046	5.580	3.100	3.640	.086	3.000
3	1.820	4.600	6.920	5.820	.078	.074	.048	3.930	3.100	1.850	3.500	4.600
4	.992	4.070	7.180	1.520	.078	.078	.048	2.060	5.500	.096	.133	4.500
5	3.470	4.740	7.690	3.110	.322	.096	.048	.090	7.120	3.570	3.740	5.000
6	2.400	4.940	7.690	4.340	.078	.860	.050	.086	7.200	2.600	3.720	4.620
7	3.390	4.980	7.560	5.840	1.760	7.930	.050	.086	7.150	.103	3.680	5.210
8	3.180	5.010	7.500	5.870	7.440	8.530	.048	.086	7.150	.740	3.630	4.260
9	3.530	5.070	7.500	6.660	7.800	8.530	.066	.086	7.120	1.770	3.660	5.230
10	3.360	.112	7.500	7.370	5.800	7.780	.082	2.300	7.120	3.010	1.100	5.060
11	3.310	.082	7.470	7.260	7.660	6.400	.078	3.810	6.060	2.080	.082	5.160
12	3.450	.082	7.560	3.140	7.690	8.800	.078	.650	6.080	4.200	3.890	5.170
13	3.260	.082	7.560	2.080	7.720	11.000	.078	3.980	6.200	5.000	3.940	5.350
14	3.420	.875	7.530	4.950	7.720	20.500	.082	.370	5.510	1.620	3.720	6.190
15	3.820	1.080	7.310	4.070	7.720	25.000	.082	.950	2.470	4.440	4.010	6.540
16	3.800	2.300	7.280	6.710	7.720	25.000	2.730	1.820	.110	4.340	3.720	5.960
17	3.820	1.680	7.230	5.710	7.690	25.000	8.140	5.200	3.020	4.890	.090	4.500
18	3.760	.590	5.380	1.960	7.690	25.000	7.810	5.420	5.170	4.750	.086	5.520
19	3.810	.696	5.660	.082	3.770	25.000	8.310	3.940	6.180	3.950	4.040	5.620
20	4.150	1.550	5.680	.082	.074	25.000	8.250	.962	4.450	1.110	2.500	5.340
21	3.800	1.000	6.750	2.030	5.240	25.000	3.240	2.790	1.230	.090	2.440	6.540
22	3.860	2.760	5.560	.082	4.440	25.000	8.280	1.310	2.900	.086	3.760	5.500
23	3.010	1.740	.808	2.030	4.380	25.000	8.190	5.210	.086	2.790	3.900	6.460
24	3.200	1.640	3.380	6.220	.198	25.000	8.190	5.800	.082	.096	4.200	7.040
25	3.030	1.170	.090	.655	1.340	25.000	8.170	4.000	.082	.090	.080	6.060
26	2.950	.825	3.550	.082	5.380	22.000	8.170	1.500	.082	.343	3.800	5.900
27	4.440	2.870	.086	5.510	2.700	15.000	8.190	.080	.082	.362	3.600	5.910
28	4.130	2.290	.262	6.780	3.570	9.800	5.460	.080	3.200	.090	4.500	5.450
29	3.920	4.520	.086	6.080		5.020	1.010	1.300	2.880	3.780	2.300	4.600
30	3.930	5.000	.082	.818		.082	.090	4.900	.166	3.660	5.600	5.500
31	3.990		.640	2.540		.082		4.300		2.020	2.000	

PLANKTON POPULATION

STATE TENNESSEE
MAJOR BASIN TENNESSEE RIVER
MINOR BASIN CLINCH RIVER
STATION LOCATION CLINCH RIVER AT CLINTON, TENNESSEE

DATE OF SAMPLE			DOMINANT SPECIES OF DIATOMS AND PERCENT OF TOTAL DIATOMS (See text for Codes)									FUNGI AND SHEATHED BACTERIA (Number per ml.)	MICROINVERTEBRATES																			
			1ST		2ND		3RD		4TH				PROTOZOA (Identifiable) (Number per ml.)	ROTIFERS										CRUSTACEA									
														NUMBER PER LITER	GENERA AND COUNT LEVEL (See text for Codes)										NUMBER PER LITER	GENERA AND COUNT LEVEL (See text for Codes)						REBATOSEES (Number per liter)	OTHER ANIMAL FORMS (Number per liter)
															1ST		2ND		3RD		4TH		5TH				1ST		2ND		3RD			
MONTH	DAY	YEAR	SPECIES	PERCENT	SPECIES	PERCENT	SPECIES	PERCENT	SPECIES	PERCENT	OTHER SPECIES PERCENT				GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL			GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL		
10	2	62	2	14	56	8	47	6	91	6	66		-	0										0							0	0
10	15	62	56	14	2	13	15	9	16	8	56		-	0										0							0	0
11	5	62	56	24	2	9	58	6	27	6	55		-	3										0							0	0
11	19	62	56	25	2	19	58	7	16	6	43		-	0										0							0	0
12	3	62	56	29	80	7	16	6	65	6	52	30	0	0										2							0	0
12	17	62	56	19	27	18	58	14	25	6	43	870	0	0										0							0	2
1	7	63	56	35	82	13	36	11	92	7	34		-	0										0							0	0
1	21	63	36	47	92	8	56	6	57	5	34		-	0										1							0	0
2	4	63	36	69	92	5	51	3	31	3	20		-	0										0							0	0
2	18	63	36	40	93	7	35	7	52	7	39		-	0										2							0	0
3	4	63	36	78	37	6	92	5	2	2	9		-	0										0							0	0
3	18	63											-	0										1							0	0
4	1	63											-	0										0							1	1
4	15	63	26	58	35	8	92	6	31	5	23		-	0										0							0	0
5	6	63	65	38	2	6	71	5	46	5	46		-	-										-							-	-
5	20	63	65	28	66	17	31	9	64	8	38		-	-										-							-	-
6	3	63	65	45	64	12	51	8	66	5	30		-	-										-							-	-
6	17	63	65	44	66	12	2	9	71	6	29		-	-										-							-	-
7	1	63	51	21	15	16	65	15	64	13	35		-	-										-							-	-
7	15	63											-	-										-							-	-
8	5	63	2	19	51	17	65	14	15	9	41		-	-										-							-	-
8	19	63	2	24	65	9	51	7	64	7	53		-	-										-							-	-
9	3	63											-	-										-							-	-
9	16	63											-	-										-							-	-

PLANKTON POPULATION

STATE TENNESSEE
MAJOR BASIN TENNESSEE RIVER
MINOR BASIN CLINCH RIVER
STATION LOCATION CLINCH RIVER AT
CLINTON, TENNESSEE 119

DATE OF SAMPLE			ALGAE (Number per milliliter)									INERT DIATOM SHELLS		MOST ABUNDANT ALGAE - Genera and Count Level per ml. (See text for Codes)																	
			TOTAL	BLUE-GREEN		GREEN		FLAGELLATED (Pigmented)		DIATOMS				1ST		2ND		3RD		4TH		5TH		6TH		7TH		8TH		9TH		10TH	
MONTH	DAY	YEAR		COCCOID	FILAMENTOUS	COCCOID	FILAMENTOUS	GREEN	OTHER	CENTRIC	PENNATE	CENTRIC	PENNATE	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL
10	2	62	00	0	0	0	0	10	0	10	10	0	30																		
10	15	62	100	0	0	0	0	10	0	20	60	0	0																		
11	5	62	100	0	0	120	0	0	0	0	0	0	0																		
11	19	62	200	0	0	50	0	0	0	20	90	20	30																		
12	3	62	200	0	0	30	0	0	20	120	60	20	140																		
12	17	62	300	0	60	40	0	0	0	150	80	40	0																		
1	7	63	200	0	0	0	0	0	0	90	150	90	70																		
1	21	63	600	0	20	0	0	0	0	130	480	0	130	82	2																
2	4	63	400	0	0	0	0	0	0	40	310	0	20	82	1																
2	18	63	400	0	0	0	0	0	150	40	180	70	20	62	1																
3	4	63	300	0	0	0	0	20	0	0	260	0	70	82	1																
3	18	63	200	0	0	0	10	0	10	70	60	30	10																		
4	1	63	00	0	0	0	0	0	10	0	30	0	10																		
4	15	63	700	0	0	0	0	0	150	440	150	0	210	68	2																
5	6	63	100	0	0	0	0	0	0	0	100	0	10																		
5	20	63	100	0	0	0	0	0	0	0	120	0	60																		
6	3	63	100	0	0	0	0	0	0	0	140	0	10																		
6	17	63	100	0	30	0	0	0	0	0	80	0	0																		
7	1	63	500	0	0	20	0	0	0	40	440	70	240	79	1																
7	15	63	100	0	0	0	0	0	0	0	70	0	20																		
8	5	63	100	0	0	0	0	0	0	0	70	0	90																		
8	19	63	200	0	0	0	0	20	0	0	220	20	0																		
9	3	63	200	20	0	0	0	0	0	90	110	90	190																		
9	16	63	100	0	0	0	0	0	0	90	20	50	140																		

CHEMICAL, PHYSICAL AND BACTERIOLOGICAL ANALYSES

STATE TENNESSEE
MAJOR BASIN TENNESSEE RIVER
MINOR BASIN CLINCH RIVER
STATION LOCATION CLINCH RIVER AT CLINTON, TENNESSEE

DATE OF SAMPLE			TEMP. (Degrees Centigrade)	DISSOLVED OXYGEN mg/l	pH	B.O.D. mg/l	C.O.D. mg/l	CHLORINE DEMAND		AMMONIA-NITROGEN mg/l	CHLORIDES mg/l	ALKALINITY mg/l	HARDNESS mg/l	COLOR (units)	TURBIDITY (units)	SULFATES mg/l	PHOSPHATES mg/l	TOTAL DISSOLVED SOLIDS mg/l	COLIFORMS per 100 ml.
MONTH	DAY	YEAR						1-HOUR mg/l	24-HOUR mg/l										
10	15	62	-	-	7.8	-	-	-	-	-	44	104	124	0	*25	21	.0	201	-
10	22	62	-	-	-	-	-	-	-	-	3	108	112	5	*25	16	.0	145	-
10	29	62	6.8	-	7.5	-	-	-	-	.1	3	96	104	0	*25	20	.0	130	-
11	5	62	15.0	-	8.2	-	-	-	-	.1	13	92	100	0	*25	13	.0	120	1500
11	12	62	10.0	11.2	8.1	-	-	-	-	.1	3	76	88	5	*25	17	.0	99	1200
11	19	62	5.5	10.7	7.8	-	-	-	-	.0	5	100	108	0	*25	13	.0	140	600
11	26	62	5.0	11.2	7.9	-	-	-	-	.0	20	112	128	0	*25	20	.0	205	500
12	3	62	10.2	9.0	7.9	-	-	-	-	.1	4	100	100	0	*25	19	.0	113	300
12	10	62	10.0	9.6	8.1	-	-	-	-	.1	6	94	120	0	*25	16	.0	125	50
12	17	62	10.0	10.5	8.1	-	-	-	-	.1	4	98	104	0	*25	16	.0	140	50
12	24	62	5.0	12.5	8.0	-	-	-	-	.1	4	106	116	0	*25	15	.0	140	930
1	7	63	10.0	9.7	7.9	-	-	-	-	1.0	4	88	110	-	*25	16	.0	116	-
1	14	63	5.0	13.0	8.0	-	-	-	-	1.0	4	96	116	-	*25	18	.0	115	1100
1	21	63	5.0	11.5	8.1	-	-	-	-	.1	4	100	116	-	*25	26	.0	130	2100
1	28	63	5.0	12.0	7.9	-	-	-	-	1.0	5	100	116	-	*25	16	.0	150	250
2	4	63	5.2	18.0	8.2	-	-	-	-	.2	5	80	120	-	120	29	.0	130	5300
2	18	63	5.0	13.0	7.9	-	-	-	-	1.0	3	108	112	0	*25	14	.0	120	100
2	26	63	5.1	12.2	8.0	-	-	-	-	.1	3	108	80	0	*25	14	.0	130	440
3	4	63	10.0	15.0	8.4	-	-	-	-	.1	3	92	100	0	*25	22	.0	125	1400
3	11	63	11.0	14.0	8.0	-	-	-	-	.1	4	90	110	0	*25	17	.0	126	-
3	12	63	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	14000
3	18	63	6.0	14.6	7.6	-	-	-	-	.0	4	92	120	0	*25	10	.0	118	220
3	26	63	5.0	14.2	7.5	-	-	-	-	.0	5	80	104	5	*25	13	.0	119	1500
4	1	63	15.0	12.1	7.6	-	-	-	-	.0	6	104	116	0	*25	20	.0	130	100
4	8	63	15.1	-	8.1	-	-	-	-	.1	4	100	104	0	*25	25	.0	127	200
4	15	63	15.4	17.1	8.4	-	-	-	-	.1	3	88	92	0	*25	25	.0	114	200
4	22	63	10.0	16.5	7.3	-	-	-	-	.0	2	80	104	0	*25	13	.0	99	210
5	7	63	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	510
5	20	63	15.1	17.2	8.4	-	-	-	-	.1	5	80	88	0	*25	13	.0	115	-
5	27	63	10.2	-	7.6	-	-	-	-	.0	3	82	96	5	*25	14	.0	107	-
5	28	63	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2100
6	3	63	10.2	13.2	7.6	-	-	-	-	.0	4	76	88	0	*25	12	.0	109	-
6	4	63	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	600
6	10	63	10.5	14.1	7.6	-	-	-	-	.0	8	72	88	0	*25	11	.0	91	300
6	17	63	10.0	14.0	7.6	-	-	-	-	.0	6	78	88	5	*25	11	.0	115	1300
6	25	63	20.0	14.3	7.6	-	-	-	-	.0	4	84	92	5	*25	17	.0	128	1400
7	1	63	15.0	-	7.6	-	-	-	-	-	4	74	88	0	*25	12	.0	103	-
7	8	63	15.0	11.0	7.6	-	-	-	-	.0	5	92	120	0	*25	16	.0	136	2000

CHEMICAL, PHYSICAL AND BACTERIOLOGICAL ANALYSES

STATE TENNESSEE

MAJOR BASIN TENNESSEE RIVER

MINOR BASIN CLINCH RIVER

STATION LOCATION CLINCH RIVER AT CLINTON, TENNESSEE 119

DATE OF SAMPLE			TEMP. (Degrees Centigrade)	DISSOLVED OXYGEN mg/l	pH	B.O.D. mg/l	C.O.D. mg/l	CHLORINE DEMAND		AMMONIA-NITROGEN mg/l	CHLORIDES mg/l	ALKALINITY mg/l	HARDNESS mg/l	COLOR (scale units)	TURBIDITY (scale units)	SULFATES mg/l	PHOSPHATES mg/l	TOTAL DISSOLVED SOLIDS mg/l	COLIFORMS per 100 ml.
MONTH	DAY	YEAR						1-HOUR mg/l	24-HOUR mg/l										
7	15	63	14.5	11.2	7.5	-	-	-	-	.0	3	74	88	5	*25	17	.0	93	2300
7	22	63	18.0	-	8.0	-	-	-	-	.0	4	76	88	0	*25	14	.0	98	1100
7	29	63	21.0	-	8.4	-	-	-	-	.0	4	80	104	0	*25	18	.0	105	100
8	5	63	19.0	9.3	7.6	-	-	-	-	.0	4	84	96	0	*25	13	.0	109	500
8	12	63	19.0	13.5	7.6	-	-	-	-	.0	6	84	102	0	*25	14	.0	103	200
8	19	63	21.0	10.5	7.8	-	-	-	-	.0	5	82	92	0	*25	14	.0	111	-
8	20	63	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	*17
8	26	63	10.6	8.5	7.8	-	-	-	-	.0	7	84	96	10	*25	23	.0	128	-
8	27	63	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	500
9	3	63	14.0	8.0	7.4	-	-	-	-	.0	8	78	92	5	*25	15	.0	112	800
9	10	63	15.2	9.7	7.6	-	-	-	-	.0	3	78	86	0	*25	14	.0	102	630
9	16	63	16.1	9.0	7.5	-	-	-	-	.0	3	80	90	5	*25	13	.0	105	-
9	17	63	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	100
9	23	63	15.2	5.0	7.4	-	-	-	-	.0	-	-	-	-	-	-	-	-	230
9	30	63	15.4	5.6	7.6	-	-	-	-	.0	3	94	96	0	*25	16	.0	121	200

FISH POPULATION

State: Tennessee
Major basin: Tennessee River
Minor basin: Clinch River
Station location: Clinch River at Clinton, Tenn.

		Collecting method											
		Rotenone						Electric shocker					
Sampling date(s)		July 29, 1963						July 25, 1963					
Total number of fish		8,808						655					
Total weight of fish (pounds)		67.2											
Group	Species collected	Percent of total		Length range (inches) number of fish				Percent of total		Length range (inches) number of fish			
		Number	Weight	0–4	5–8	9–12	Over 12	Number	Weight	0–4	5–8	9–12	Over 12
I	Largemouth bass	<0.1	<0.1	2									
	Smallmouth bass							0.2					
	White crappie	.1	.3	6				.9					
	Banded sculpin	<.1	.1	2				2.4					
		.1	.4					3.5					
II	Rainbow trout	.1	.2	6				.2					
	Emerald shiner	.2	.4	16				2.4					
	Common shiner	<.1	<.1	4				4.9					
	Whitetail shiner	<.1	<.1	1									
	Spotfin shiner	.1	<.1	9				2.0					
	Bluntnose minnow	<.1	<.1	2				.3					
	Fathead minnow	<.1	<.1	2									
	Hogsucker	<.1	1.7	1		2		.3					
	Bluegill	<.1	.2		1			.3					
	Rock bass	<.1	.4		2			.2					
	Logperch	.2	.3	19				1.2					
		.6	3.2					11.8					

FISH POPULATION—Continued

State: Tennessee
Major basin: Tennessee River
Minor basin: Clinch River
Station location: Clinch River at Clinton, Tenn.

		Collecting method											
		Rotenone						Electric shocker					
Sampling date(s)		July 29, 1963						July 25, 1963					
Total number of fish		8.808						655					
Total weight of fish (pounds)		67.2											
Group	Species collected	Percent of total		Length range (inches) number of fish				Percent of total		Length range (inches) number of fish			
		Number	Weight	0–4	5–8	9–12	Over 12	Number	Weight	0–4	5–8	9–12	Over 12
III	Gizzard shad	99.0	90.1	8,668	.....	3	2	79.3	.....	.....	.....	.....	.....
	Stoneroller	.1	.1	12	.....	.....	.....	4.4	.....	.....	.....	.....	.....
		99.1	90.2	.....	.....	.....	.....	83.7	.....	.....	.....	.....	.....
IV	Ohio redhorse	<.1	1.9	.....	.....	.....	1	.....	.....	.....	.....	.....	.....
	Black redhorse	.2	2.3	3	17	.....	.....	.6	.....	.....	.....	.....	.....
		.2	4.2	.....	.....	.....	.....	.6	.....	.....	.....	.....	.....
V	Quillback carpsucker	<.1	.2	4	.....	.....	.....	.....	.....	.....	.....	.....	.....
	White sucker	<.1	.8	3	.....	2	.....	.....	.....	.....	.....	.....	.....
		<.1	1.0	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
VI	Carp	<.1	.2	1	1	.....	.....	.....	.....	.....	.....	.....	.....
	Goldfish	<.1	.2	1	1	.....	.....	.....	.....	.....	.....	.....	.....
	Smallmouth buffalo	<.1	.2	4	.....	.....	.....	.....	.....	.....	.....	.....	.....
	Channel catfish	.1	.4	13	.....	.....	.....	.2	.....	.....	.....	.....	.....
	Flathead catfish	.....	.....	.....	.....	.....	.....	.2	.....	.....	.....	.....	.....
		.1	1.0	.....	.....	.....	.....	.4	.....	.....	.....	.....	.....

TENNESSEE RIVER AT PICKWICK LANDING, TENNESSEE

This station is located in the powerhouse at Pickwick Dam which is approximately eight miles below the Alabama-Tennessee State line. The penstocks take water from between 30 and 40 feet deep in Pickwick Lake.

The river at and immediately below this station serves as a source of water supply for the town of Clifton, Tennessee (population 700), and for the Tennessee River Pulp and Paper Company.

Pickwick Lake provides recreation in the form of fishing, boating, and swimming. The tailwaters immediately below Pickwick Dam support a sport fishery for sauger, white bass and catfish. The Tennessee Department of Fish and Game estimates that during a nine month period in 1959-60, in excess of 500,000 party hours were expended to catch approximately 70,000 sauger, 70,000 white bass and 337,000 catfish in the Pickwick tailwater area alone.

Qualitative bottom sampling on April 16, 1963 indicated the presence of a diverse fauna. Quantitative samples were collected on August 7, 1963; these are being analyzed and evaluated.

DDT has been identified in four different carbon adsorption method samples during the water year.

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Station Location:	Tennessee River at Pickwick Landing, Tennessee
Major Basin:	Tennessee River
Minor Basin:	Tennessee River - Main Stem and Minor Tributary
Station at:	35°04' Latitude 88°15' Longitude
Miles above mouth:	207
Activation Date:	October 24, 1961
Sampled by:	Hardin County Tennessee Health Department
Field Analysis by:	U.S. Public Health Service
Other Cooperating Agencies:	Tennessee Stream Pollution Control Commission Tennessee Department of Public Health
Hydrologic Data:	
Nearest pertinent gaging station:	At Savannah, Tennessee
Gaging station operated by:	Tennessee Valley Authority
Drainage area at gaging station:	33,140 square miles
Period of record:	1930 to present
Average discharge in record period:	53,000 cfs.

Maximum discharge in record period: 403,000 cfs.

Minimum discharge in record period: 1,100 cfs. (daily)

Remarks: Minimum discharge resulted from experimental closure of Pickwick Landing Dam. Flow regulated by upstream reservoir operations.

ALKYL BENZENE SULFONATE (ABS)

Date	mg/l

ELEMENTAL ANALYSES

		Composite Interval 10/1/62 to 12/31/62	Composite Interval 4/1/63 to 6/30/63
Analysis by wet or flame methods. Results in mg/l	F	.27	.15
	Na	8.0	3.7
	K	1.7	.9
Analysis by Spectrographic methods. Results in micrograms per liter	Zn	172	5
	Cd	*1	*2
	As	*10	*10
	B	14	6
	P	*5	*4
	Fe	686	9
	Mo	3	4
	Mn	.8	1.1
	Al	—	20
	Be	*.03	*.02
	Cu	6	5
	Ag	*.2	*.2
	Ni	*1	*2
	Co	*2	*2
	Pb	*5	*2
	Cr	*1	*2
	V	*1	*4
	Ba	27	10
	Sr	39	13

*Actual value is less than the amount shown. Reported result indicates limit of sensitivity at which test was performed. See text for explanation.

STRONTIUM 90 ACTIVITY

Composite Interval	pc/l	±	Composite Interval	pc/l	±
October to December	1.4	.2	April to June	—	—
January to March	—	—	July to September	2.9	.3

± at 95% Confidence Limits

SPECIFIC QUALITATIVE IDENTIFICATIONS FROM CARBON ADSORPTION EXTRACTS WATER YEAR 1962-3

Interval	Compound	Concentration* ug/l
10/16 - 10/23/62	DDT	
11/19 - 11/26/62	DDT	
11/27 - 12/27/62	DDT	
6/17 - 6/24/63	DDT	0.011

*Concentration values, where shown, are calculated from quantitative gas chromatographic analysis of the aromatic fractions of CCE, and may be assigned the units of ug/l. In light of the unknown efficiency of carbon adsorption sampling for these compounds, the reported values represent minima, the actual values being equal to or greater than the reported values.

See page 21.

RADIOACTIVITY DETERMINATIONS

STATE TENNESSEE

MAJOR BASIN TENNESSEE RIVER

MINOR BASIN TENN. RIVER-MAIN STEM & MINOR TRIB.

STATION LOCATION TENNESSEE RIVER AT PICKWICK LANDING, TENNESSEE 99

DATE SAMPLE TAKEN			RADIOACTIVITY IN WATER														RADIOACTIVITY IN PLANKTON					
			DATE OF DETERMINATION		ALPHA						BETA						DATE OF DETERMINATION		GROSS ACTIVITY			
					SUSPENDED		DISSOLVED		TOTAL		SUSPENDED		DISSOLVED		TOTAL				ALPHA		BETA	
MO.	DAY	YR.	MO.	DAY	pc/l	±	pc/l	±	pc/l	±	pc/l	±	pc/l	±	pc/l	±	MO.	DAY	pc/g	±	pc/g	±
10	2	62	10	26	2	2	0	1	2	2	12	14	21	7	33	16						
10	9	62	11	7	0	0	0	1	0	1	3	5	21	6	24	8						
10	16	62	11	30	0	0	0	0	0	0	4	5	26	7	30	9						
10	23	62	11	21	0	0	0	0	0	0	7	6	19	7	26	9						
10	31	62	11	26	0	0	0	0	0	0	4	3	14	3	18	4						
11	7	62	12	31	0	0	0	1	0	1	2	3	18	4	20	4						
11	13	62	1	3	0	0	0	0	0	0	1	6	28	9	29	11						
11	19	62	12	31	-	-	-	-	-	-	1	3	33	4	34	5						
11	27	62	12	15	0	0	0	0	0	0	2	4	45	6	47	7						
12	3	62	12	28	0	1	0	0	0	1	5	5	35	7	40	9						
12	11	62	1	4	0	1	0	1	0	1	9	6	27	7	36	9						
12	18	62	1	7	0	0	0	1	0	1	0	3	25	4	25	5						
12	27	62	1	10	0	0	0	0	0	0	6	6	38	7	44	9						
12	31	62	1	14	0	1	0	1	0	1	8	3	44	4	52	5						
1	30	63	2	21*	0	1	0	1	0	1	14	6	39	7	53	9						
2	27	63	3	20*	0	1	0	1	0	1	29	6	44	8	73	10						
3	26	63	4	22*	0	0	1	1	1	1	50	4	28	3	78	5						
4	30	63	5	31*	0	0	1	1	1	1	17	4	31	5	48	7						
5	27	63	6	21*	0	1	0	1	0	1	25	5	28	5	53	7						
6	24	63	7	30*	1	1	0	0	1	1	13	7	19	6	32	9						
7	23	63	9	9*	1	1	0	1	1	1	18	3	23	4	41	5						
8	27	63	10	4*	0	1	0	0	0	1	9	6	24	7	33	9						
9	30	63	11	6*	1	1	0	0	1	1	5	6	24	7	29	9						

PLANKTON POPULATION

STATE TENNESSEE

MAJOR BASIN TENNESSEE RIVER

MINOR BASIN TENN. RIVER-MAIN STEM & MINOR TRIB.

STATION LOCATION TENNESSEE RIVER AT

PICKWICK LANDING, TENNESSEE 099

DATE OF SAMPLE			DOMINANT SPECIES OF DIATOMS AND PERCENT OF TOTAL DIATOMS (See text for Codes)									FUNGI AND SHEATHED BACTERIA (Number per ml)	MICROINVERTEBRATES																					
			1ST		2ND		3RD		4TH					ROTIFERS										CRUSTACEA										
															GENERA AND COUNT LEVEL (See text for Codes)												GENERA AND COUNT LEVEL (See text for Codes)								
MONTH	DAY	YEAR	SPECIES	PERCENT	SPECIES	PERCENT	SPECIES	PERCENT	SPECIES	PERCENT	OTHER SPECIES PERCENT		PROTOZOA (Identify Infecting Organisms) (Number per ml)	NUMBER PER LITER	1ST		2ND		3RD		4TH		5TH		NUMBER PER LITER	1ST		2ND		3RD		HELMINTHS (Identify Eggs) (Number per liter)	OTHER ANIMAL FORMS (Number per liter)
															GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL		GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL		
10	2	62	65	10	66	9	26	9	58	7	65		-	243	17	6	21	3	22	3					0							0	0
10	16	62	27	30	61	30	26	14	82	13	13		-	245	22	5	17	4	21	4	11	3	2	2	3	51	1					0	0
11	7	62	82	48	97	11	57	7	2	5	29		-	0											0							0	0
11	19	62	31	12	27	12	57	10	92	9	57		-	0											0							0	0
12	3	62											-	0											0							0	0
12	17	62											-	0											0							0	0
1	8	63	82	56	57	26	56	8	89	2	8	30	-	13	17	2									0							0	0
2	5	63	57	53	82	29	58	8	9	5	5		-	150	17	4	11	4	21	2					3	50	1					0	0
2	16	63	57	65	61	16	82	8	92	3	8		-	2											0							0	0
3	5	63	62	54	82	26	56	6	9	5	9		-	3											0							0	0
3	20	63	57	23	92	15	56	15	62	12	35		-	1											0							0	0
4	2	63	57	32	62	14	82	7	56	5	42		-	0											0							1	0
4	16	63											-	20	21	2									0							0	0
5	7	63	82	47	57	20	56	9	58	6	18		-	-											-							-	-
5	22	63	27	56	58	12	80	10	56	8	14		-	-											-							-	-
6	6	63	27	33	82	31	56	10	92	9	17		-	-											-							-	-
6	17	63											-	367	11	5	17	5	22	4	7	3	2	2	78	50	5	52	3			0	0
7	2	63	27	27	58	17	92	14	82	12	30		-	-											-							-	-
7	16	63											-	-											-							-	-
8	5	63	58	31	27	19	56	16	82	11	23		-	-											-							-	-
8	20	63	27	25	82	23	26	11	56	11	30		-	-											-							-	-
9	3	63	26	31	23	26	82	21	58	4	18		-	-											-							-	-
9	17	63											-	-											-							-	-

PLANKTON POPULATION

STATE TENNESSEE

MAJOR BASIN TENNESSEE RIVER

MINOR BASIN TENN. RIVER-MAIN STEM & MINOR TRIB.

STATION LOCATION TENNESSEE RIVER AT

PICKWICK LANDING, TENNESSEE 99

DATE OF SAMPLE			ALGAE (Number per milliliter)									INERT DIATOM SHELLS		MOST ABUNDANT ALGAE - Genera and Count Level per ml. (See text for Codes)																	
			TOTAL	BLUE-GREEN		GREEN		FLAGELLATED (Pigmented)		DIATOMS				1ST		2ND		3RD		4TH		5TH		6TH		7TH		8TH		9TH		10TH	
MONTH	DAY	YEAR		COCCOID	FILAMENTOUS	COCCOID	FILAMENTOUS	GREEN	OTHER	CENTRIC	PENNATE	CENTRIC	PENNATE	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL
10	2	62	300	0	0	0	0	170	0	80	40	40	0	51	1																
10	16	62	5200	0	50	50	0	270	0	4730	110	140	0	68	4	69	4	71	3	51	1										
11	7	62	600	0	0	0	0	40	0	600	0	0	0	69	2																
11	19	62	200	0	40	40	0	0	0	40	120	0	0																		
12	3	62	00	0	0	0	0	0	0	50	0	0	0																		
12	17	62	200	0	0	0	0	0	0	140	20	30	50																		
1	8	63	700	0	0	30	0	20	0	600	50	170	30	71	2	69	1														
2	5	63	2400	0	80	0	0	170	0	1660	530	760	60	69	3	71	3	92	1	51	1										
2	16	63	2000	0	20	20	0	0	110	1740	90	220	70	69	3	71	2														
3	5	63	4400	0	60	40	0	80	20	3930	290	210	130	71	4	69	4														
3	20	63	100	0	0	0	0	0	0	90	40	110	110																		
4	2	63	800	0	0	0	0	60	500	170	40	40	40	60	2																
4	16	63	300	0	0	0	0	60	110	40	60	20	20																		
5	7	63	200	0	0	0	0	40	20	150	20	20	0																		
5	22	63	27000	0	20	360	0	170	230	26040	170	80	0	69	8	68	2	63	1												
6	6	63	4600	0	150	860	0	210	80	3190	110	400	0	69	4	68	2	71	2	51	1	26	1								
6	17	63	400	0	20	90	0	0	20	130	130	20	70																		
7	2	63	2700	0	110	510	0	70	20	1430	530	220	40	69	3	68	2	92	1	35	1	88	1	71	1						
7	16	63	500	0	20	100	0	100	0	170	60	20	20																		
8	5	63	2200	40	40	920	0	110	0	750	290	40	70	69	2	26	1	25	1												
8	20	63	1700	90	40	480	0	40	0	880	150	300	90	68	2	71	1	69	1												
9	3	63	1800	0	20	20	20	1230	40	350	90	40	20	51	4	68	1														
9	17	63	500	50	0	110	0	250	0	50	0	90	50	51	1																

ORGANIC CHEMICALS

RECOVERED BY CARBON FILTER TECHNIQUE

RESULTS IN MICROGRAMS PER LITER
(Parts per billion)

STATE TENNESSEE

MAJOR BASIN TENNESSEE RIVER

MINOR BASIN TENN. RIVER-MAIN STEM & MINOR TRIB.

STATION LOCATION TENNESSEE RIVER AT PICKWICK LANDING, TENNESSEE 99

DATE OF SAMPLE BEGINNING MONTH	DAY	YEAR	END MONTH	DAY	GALLONS FILTERED	EXTRACTABLES TOTAL	CHLORO-FORM	ALCOHOL	CHLOROFORM EXTRACTABLES ETHER INSOLUBLES	WATER SOLUBLES	NEUTRALS TOTAL	ALIPHATICS	AROMATICS	OXYGEN-ATED COMPOUNDS	LOSS	WEAK ACIDS	STRONG ACIDS	BASES	LOSS
10	16	62	10	23	4510	174	48	126	1	14	12	1	1	10	0	5	5	1	10
11	19	62	11	26	3580	148	55	93	2	18	14	1	1	11	1	5	4	2	10
11	27	62	12	27	4310	177	40	137	1	12	14	1	1	12	0	5	3	1	4
1	24	63	1	30	3379	150	42	108	-	-	-	-	-	-	-	-	-	-	-
2	19	63	2	26	4600	114	43	71	4	12	11	0	1	9	1	4	3	1	8
3	19	63	3	26	4529	155	52	103	-	-	-	-	-	-	-	-	-	-	-
4	16	63	4	24	5270	144	49	95	2	14	15	1	1	12	1	5	4	1	8
5	14	63	5	22	3210	148	54	94	-	-	-	-	-	-	-	-	-	-	-
6	17	63	6	24	3930	152	74	78	4	24	17	1	1	15	0	7	7	1	14
7	16	63	7	23	1530	276	95	181	-	-	-	-	-	-	-	-	-	-	-
8	20	63	8	27	*	-	-	-	-	-	-	-	-	-	-	-	-	-	-
9	11	63	9	17	5000#	119	34	85	1	9	9	1	1	7	0	4	3	1	7

* FLOW UNKNOWN

\# ESTIMATED

CHEMICAL, PHYSICAL AND BACTERIOLOGICAL ANALYSES

STATE TENNESSEE

MAJOR BASIN TENNESSEE RIVER

MINOR BASIN TENN. RIVER-MAIN STEM & MINOR TRIB.

STATION LOCATION TENNESSEE RIVER AT

PICKWICK LANDING, TENNESSEE 99

DATE OF SAMPLE			TEMP. (Degrees Centigrade)	DISSOLVED OXYGEN mg/l	pH	B.O.D. mg/l	C.O.D. mg/l	CHLORINE DEMAND		AMMONIA-NITROGEN mg/l	CHLORIDES mg/l	ALKALINITY mg/l	HARDNESS mg/l	COLOR (scale units)	TURBIDITY (scale units)	SULFATES mg/l	PHOSPHATES mg/l	TOTAL DISSOLVED SOLIDS mg/l	COLIFORMS per 100 ml.
MONTH	DAY	YEAR						1-HOUR mg/l	24-HOUR mg/l										
10	2	62	-	7.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
10	9	62	-	7.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
10	16	62	-	8.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
10	25	62	-	7.9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
10	30	62	-	8.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
11	6	62	-	8.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
11	14	62	-	9.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
11	20	62	-	9.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
11	27	62	-	9.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
12	4	62	-	9.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
12	11	62	-	10.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
12	18	62	-	11.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
12	27	62	-	11.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1	2	63	-	11.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1	8	63	-	11.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1	15	63	-	11.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1	23	63	-	11.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1	29	63	-	12.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2	5	63	-	12.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2	12	63	-	12.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2	19	63	-	11.9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2	26	63	-	12.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3	5	63	-	12.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3	19	63	-	10.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3	26	63	-	10.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
8	27	63	-	-	-	-	-	-	-	-	10	52	68	0	*25	15	.0	90	-
9	9	63	-	-	-	-	-	-	-	-	7	56	64	0	*25	14	.0	80	-
9	17	63	-	-	-	-	-	-	-	-	8	50	60	5	*25	12	.1	90	-
9	25	63	-	-	-	-	-	-	-	-	8	52	62	5	*25	12	.0	97	-
9	30	63	-	-	-	-	-	-	-	-	8	50	60	0	*25	13	.2	92	-

STREAM FLOW DATA - 1962-1963

Thousand Cubic Feet per Second

PROVISIONAL--SUBJECT TO REVISION

Gaging Station at Savannah, Tennessee
Data Furnished by Tennessee Valley Authority
through U.S. Geological Survey

STATE: Tennessee

MAJOR BASIN: Tennessee River

MINOR BASIN: Tennessee River-Main Stem & Minor Trib.

STATION LOCATION: Tennessee River at Pickwick Landing, Tennessee

Day	October	November	December	January	February	March	April	May	June	July	August	September
1	36.600	35.500	47.700	50.300	61.600	36.700	40.700	204.000	34.900	38.200	39.600	33.900
2	29.100	34.500	44.200	57.200	63.000	32.700	28.000	176.000	23.000	28.900	43.100	33.200
3	36.700	28.700	54.400	60.100	76.800	22.800	37.300	150.000	31.700	29.300	50.500	23.800
4	49.200	29.300	49.700	63.900	81.600	42.400	31.800	121.000	36.800	29.300	52.400	26.000
5	41.300	35.300	52.300	47.600	81.400	50.700	40.000	90.500	36.600	36.000	35.100	26.300
6	38.800	35.600	55.100	31.900	80.700	91.100	29.800	73.300	39.300	42.000	35.800	34.300
7	22.300	37.200	46.000	33.300	81.800	164.000	31.900	45.700	43.700	44.000	32.000	39.000
8	21.400	37.700	44.800	39.000	81.000	184.000	45.700	51.200	39.000	37.300	35.200	31.900
9	34.000	49.800	47.100	40.800	67.700	191.000	41.300	52.100	29.800	38.700	36.300	43.500
10	38.800	45.600	48.100	32.800	51.500	195.000	34.200	40.400	43.600	35.300	35.500	42.800
11	37.400	40.900	46.300	36.000	66.500	201.000	38.000	29.700	38.900	35.600	36.400	33.400
12	33.200	51.200	54.800	44.200	58.700	239.000	37.600	30.000	33.700	33.300	32.900	37.800
13	30.000	48.300	36.400	52.600	58.300	296.000	48.400	44.900	39.400	37.700	35.100	34.000
14	25.000	39.100	22.500	52.000	63.100	317.000	39.800	43.400	37.100	38.600	34.200	36.400
15	32.600	56.400	42.200	53.900	57.600	328.000	35.500	39.200	38.500	39.900	29.500	35.600
16	36.700	51.600	25.900	51.600	55.600	335.000	33.000	29.100	44.500	35.100	30.400	41.500
17	32.700	44.700	37.300	55.700	36.100	341.000	22.500	28.200	62.300	38.500	34.300	36.700
18	36.400	43.000	28.500	57.800	42.800	313.000	25.700	29.600	35.700	45.100	23.300	36.200
19	35.100	64.700	36.900	53.200	57.500	290.000	23.900	27.700	23.800	42.900	33.700	35.600
20	35.600	55.700	37.100	43.100	57.800	278.000	27.700	43.800	29.700	41.000	31.500	35.400
21	30.100	49.400	37.800	54.400	43.400	189.000	33.500	47.400	36.800	47.200	28.400	25.300
22	35.600	39.600	36.100	56.400	52.700	163.000	26.100	49.900	55.600	56.900	31.500	23.000
23	36.800	55.700	44.700	56.400	52.800	156.000	31.200	35.000	52.000	52.800	37.100	36.100
24	40.300	52.700	51.800	58.900	48.000	142.000	24.900	32.900	29.100	51.700	40.100	34.500
25	38.200	49.500	50.800	56.500	45.200	128.000	34.400	32.800	40.900	50.700	34.600	34.800
26	36.900	53.000	74.600	52.400	56.200	128.000	36.300	54.600	37.100	54.400	35.400	35.900
27	35.400	58.200	61.900	54.500	50.100	106.000	45.800	99.000	30.200	44.500	35.700	34.100
28	18.900	54.800	54.900	64.500	36.300	67.800	59.500	120.000	37.000	41.500	36.100	21.200
29	34.700	49.400	58.800	60.800		66.100	79.600	90.600	47.100	35.500	40.200	15.800
30	33.200	48.200	64.700	58.100		53.700	139.000	48.600	47.700	34.700	43.700	27.700
31	36.400		49.700	55.500		59.800		39.100		40.900	42.200	

TENNESSEE RIVER AT BRIDGEPORT, ALABAMA

This station is located at the Widows Creek Steam Plant of the TVA, approximately 8 river miles downstream from the Alabama-Tennessee State line. The river at this point is impounded by TVA's Guntersville Dam.

The principal pollution sources are raw sewage from Bridgeport, Alabama with a connected population of 600 and primary sewage treatment plant effluent from South Pittsburg, Tennessee with a connected population of 3,100. South Pittsburg and Bridgeport are located 12 and 6 miles upstream, respectively.

The Tennessee River in this area serves as a source of water supply for Bridgeport, Alabama and during the dry season, for South Pittsburg, Tennessee, and for cooling water by TVA's Widows Creek Steam Plant.

The area has high recreational use for fishing, boating and swimming. Commercial clamming is also of considerable importance.

Station Location:	Tennessee River at Bridgeport, Alabama
Major Basin:	Tennessee River
Minor Basin:	Tennessee River - Main Stem and Minor Tributary
Station at:	34°53' Latitude 85°45' Longitude
Miles above mouth:	408
Activation Date:	October 26, 1960
Sampled by:	Stream Pollution Control Section, Tennessee Valley Authority
Field Analysis by:	Stream Pollution Control Laboratory, Tennessee Valley Authority
Other Cooperating Agencies:	None
Hydrologic Data:	
Nearest pertinent gaging station:	At Hales Bar near Chattanooga, Tenn.
Gaging station operated by:	U.S. Geological Survey
Drainage area at gaging station:	21,800 square miles
Period of record:	1930 to present
Average discharge in record period:	34,960 cfs.
Maximum discharge in record period:	241,000 cfs.
Minimum discharge in record period:	2,900 cfs. (daily)
Remarks:	Flow regulated by reservoir operations.

ALKYL BENZENE SULFONATE (ABS)

Date	mg/l

ELEMENTAL ANALYSES

		Composite Interval 10/1/62 to 12/31/62	Composite Interval 4/1/63 to 6/30/63
Analysis by wet or flame methods. Results in mg/l	F	*.01	.10
	Na	10	5.4
	K	2.2	1.0
Analysis by Spectrographic methods. Results in micrograms per liter	Zn	*2	*2
	Cd	*1	*2
	As	*11	*12
	B	20	7
	P	*3	*6
	Fe	30	4
	Mo	*1	*6
	Mn	*.6	*1.1
	Al	—	*1
	Be	*.03	*.03
	Cu	6	3
	Ag	*.2	*.3
	Ni	*1	*2
	Co	*2	*2
	Pb	*3	*3
	Cr	*1	*3
	V	*1	*6
	Ba	36	11
	Sr	118	20

*Actual value is less than the amount shown. Reported result indicates limit of sensitivity at which test was performed. See text for explanation.

STRONTIUM 90 ACTIVITY

Composite Interval	pc/l	±	Composite Interval	pc/	±
October to December	1.0	.2	April to June	1.6	.4
January to March	—	—	July to September	—	—

± at 95% Confidence Limits

SPECIFIC QUALITATIVE IDENTIFICATIONS FROM CARBON ADSORPTION EXTRACTS WATER YEAR 1962-3

Interval	Compound	Concentration* ug/l

*Concentration values, where shown, are calculated from quantitative gas chromatographic analysis of the aromatic fractions of CCE, and may be assigned the units of ug/l. In light of the unknown efficiency of carbon adsorption sampling for these compounds, the reported values represent minima, the actual values being equal to or greater than the reported values.

See page 21.

RADIOACTIVITY DETERMINATIONS

STATE ALABAMA

MAJOR BASIN TENNESSEE RIVER

MINOR BASIN TENN. RIVER-MAIN STEM & MINOR TRIB.

STATION LOCATION TENNESSEE RIVER AT BRIDGEPORT, ALABAMA 77

DATE SAMPLE TAKEN			RADIOACTIVITY IN WATER														RADIOACTIVITY IN PLANKTON					
			DATE OF DETERMINATION		ALPHA						BETA						DATE OF DETERMINATION		GROSS ACTIVITY			
					SUSPENDED		DISSOLVED		TOTAL		SUSPENDED		DISSOLVED		TOTAL				ALPHA		BETA	
MO.	DAY	YR.	MO.	DAY	pc/l	±	pc/l	±	pc/l	±	pc/l	±	pc/l	±	pc/l	±	MO.	DAY	pc/g	±	pc/g	±
10	10	62	11	30	-	-	-	-	-	-	1	5	11	6	12	8						
10	24	62	12	15	0	0	0	1	0	1	2	4	34	6	36	7						
11	21	62	12	21*	0	0	1	1	1	1	2	5	27	6	29	8						
12	20	62	1	18*	0	0	0	0	0	0	0	6	41	8	41	10						
1	30	63	2	20*	0	0	0	1	0	1	20	7	24	7	44	10						
2	27	63	3	18*	0	0	0	1	0	1	8	3	55	4	63	5						
3	27	63	4	18*	4	2	0	1	4	2	85	11	41	7	126	13						
4	24	63	6	5*	0	1	0	1	0	1	10	6	25	7	35	9						
5	22	63	6	21*	0	1	0	1	0	1	12	4	23	5	35	6						
6	19	63	7	30*	0	0	0	0	0	0	0	6	18	7	18	9						
7	31	63	9	9*	0	1	0	1	0	1	2	3	26	3	28	4						
8	28	63	10	8*	0	0	0	1	0	1	2	5	30	7	32	9						
9	24	63	10	31*	0	0	0	0	0	0	0	7	17	7	17	10						

PLANKTON POPULATION

STATE ALABAMA
MAJOR BASIN TENNESSEE RIVER
MINOR BASIN TENN. RIVER-MAIN STEM & MINOR TRIB.
STATION LOCATION TENNESSEE RIVER AT
BRIDGEPORT, ALABAMA 077

DATE OF SAMPLE			DOMINANT SPECIES OF DIATOMS AND PERCENT OF TOTAL DIATOMS (See text for Codes)									FUNGI AND SHEATHED BACTERIA (Number per ml.)	MICROINVERTEBRATES																				
			1ST		2ND		3RD		4TH				PROTOZOA (Identifiable) (Number per ml.)	ROTIFERS											CRUSTACEA							NEMATODES (Identifiable) (Number per liter)	OTHER ANIMAL FORMS (Number per liter)
														NUMBER PER LITER	GENERA AND COUNT LEVEL (See text for Codes) 1ST		2ND		3RD		4TH		5TH		NUMBER PER LITER	GENERA AND COUNT LEVEL (See text for Codes) 1ST		2ND		3RD			
MONTH	DAY	YEAR	SPECIES	PERCENT	SPECIES	PERCENT	SPECIES	PERCENT	SPECIES	PERCENT	OTHER SPECIES PERCENT				GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL		GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL		
10	10	62	56	16	16	14	10	8	58	5	57	-	-	2											0							0	0
11	7	62	56	19	10	9	62	8	16	7	57	-	-	0											0							0	0
11	21	62	56	11	2	9	82	7	10	6	67	-	-	0											0							0	0
12	5	62										-	-	0											0							0	0
12	20	62	56	24	57	24	80	20	23	8	24	-	-	2											0							0	0
1	2	63	57	19	56	14	61	8	2	6	53	-	-	4											0							1	0
1	16	63	57	80	61	8	82	2	56	2	8	-	-	30	11	2	17	2							0							0	0
1	30	63	57	60	82	10	56	7	9	3	20	80	0	12	11	2									0							0	0
2	13	63	57	79	61	8	82	2	9	1	10	-	-	23	17	2									0							0	0
2	27	63	57	61	61	14	82	5	9	2	18	-	-	0											0							0	1
3	13	63										-	-	0											0							0	0
3	27	63	57	24	56	23	92	8	36	4	41	-	-	0											0							0	0
4	10	63	57	42	56	19	61	6	62	6	27	-	-	2											0							0	0
4	24	63	56	31	82	25	57	12	62	6	26	-	-	1											1							0	0
5	22	63	82	48	56	23	58	10	57	4	15	-	-	1											0							0	0
6	5	63	82	33	56	24	58	21	57	9	13	-	-	168	11	5	21	3	22	3	17	1			17	50	3					0	0
6	19	63	58	18	35	16	23	15	57	13	38	-	-	0											0							0	0
7	3	63	58	30	56	24	47	13	82	11	22	-	-	18	11	2	17	1							0							0	0
7	17	63										-	-	1											0							0	0
7	31	63	56	55	58	10	95	9			26	-	-	53	17	3	11	2	21	1					0							0	0
8	14	63	56	33	58	16	92	16	28	6	29	-	-	11	11	1									C							0	0
8	28	63	56	37	58	14	82	9	92	6	34	-	0	11	11	1									0							0	0
9	11	63										-	-	0											0							0	0

PLANKTON POPULATION

STATE ALABAMA

MAJOR BASIN TENNESSEE RIVER

MINOR BASIN TENN. RIVER-MAIN STEM & MINOR TRIB.

STATION LOCATION TENNESSEE RIVER AT

BRIDGEPORT, ALABAMA 77

DATE OF SAMPLE			ALGAE (Number per milliliter)									INERT DIATOM SHELLS		MOST ABUNDANT ALGAE - Genera and Count Level per ml. (See text for Codes)																	
			TOTAL	BLUE-GREEN		GREEN		FLAGELLATED (Pigmented)		DIATOMS				1ST		2ND		3RD		4TH		5TH		6TH		7TH		8TH		9TH		10TH	
MONTH	DAY	YEAR		COCCOID	FILAMENTOUS	COCCOID	FILAMENTOUS	GREEN	OTHER	CENTRIC	PENNATE	CENTRIC	PENNATE	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL
10	10	62	00	10	0	0	0	20	0	0	10	10	10																		
11	7	62	100	0	0	0	0	0	0	20	50	20	0																		
11	21	62	300	0	0	0	0	0	0	0	330	0	0																		
12	5	62	100	0	0	0	0	0	0	50	20	0	30																		
12	20	62	300	0	0	20	0	20	0	260	0	20	30																		
1	2	63	100	0	0	0	0	50	0	80	20	20	60																		
1	16	63	500	0	40	0	0	0	0	420	60	40	40	69	1	71	1														
1	30	63	400	0	60	40	0	0	0	230	60	80	80	69	1																
2	13	63	400	0	0	40	0	40	0	260	70	130	40	69	1																
2	27	63	600	0	20	0	0	0	0	550	20	90	70	69	2																
3	13	63	300	0	0	0	0	0	50	80	200	20	90																		
3	27	63	300	0	0	0	0	20	40	40	200	20	70																		
4	10	63	900	0	0	0	0	60	230	380	210	0	20	69	1																
4	24	63	300	0	70	30	0	0	10	150	40	80	100																		
5	22	63	500	0	0	0	0	0	0	400	110	90	0	71	2																
6	5	63	500	0	0	40	0	70	0	290	70	40	40	69	1																
6	19	63	100	0	0	10	0	0	0	70	30	40	10																		
7	3	63	100	0	0	20	0	20	20	0	0	0	0																		
7	17	63	200	0	0	0	0	20	0	90	40	20	0																		
7	31	63	1900	0	0	130	0	0	0	1550	210	1720	190	69	2																
8	14	63	500	0	20	220	0	0	20	190	70	370	110																		
8	28	63	400	0	0	40	0	0	70	200	90	20	0	69	1																
9	11	63	300	0	0	70	0	70	0	110	70	40	70																		

ORGANIC CHEMICALS

RECOVERED BY CARBON FILTER TECHNIQUE

RESULTS IN MICROGRAMS PER LITER
(Parts per billion)

STATE ALABAMA

MAJOR BASIN TENNESSEE RIVER

MINOR BASIN TENN. RIVER-MAIN STEM & MINOR TRIB.

STATION LOCATION TENNESSEE RIVER AT BRIDGEPORT, ALABAMA 77

DATE OF SAMPLE BEGINNING MONTH	DAY	YEAR	END MONTH	DAY	GALLONS FILTERED	EXTRACTABLES TOTAL	CHLORO-FORM	ALCOHOL	CHLOROFORM EXTRACTABLES ETHER INSOLUBLES	WATER SOLUBLES	NEUTRALS TOTAL	ALIPHATICS	AROMATICS	OXYGEN-ATED COMPOUNDS	LOSS	WEAK ACIDS	STRONG ACIDS	BASES	LOSS
10	25	62	11	2	5005	152	65	87	-	-	-	-	-	-	-	-	-	-	-
11	26	62	12	4	5093#	142	36	106	1	10	12	1	1	9	1	4	2	1	6
12	21	62	12	29	5130	165	40	125	-	-	-	-	-	-	-	-	-	-	-
1	17	63	1	25	5010	181	73	108	1	17	26	2	3	21	0	11	8	1	9
2	14	63	2	22	5040	111	44	67	-	-	-	-	-	-	-	-	-	-	-
3	18	63	3	26	5000	112	41	71	2	11	12	2	2	8	0	4	3	1	8
4	1	63	4	19	5030	97	37	60	-	-	-	-	-	-	-	-	-	-	-
5	11	63	5	20	5000	142	66	76	3	18	15	1	1	12	1	6	8	1	15
6	7	63	6	16	5050	96	35	61	-	-	-	-	-	-	-	-	-	-	-
7	5	63	7	15	5240	148	67	81	1	22	18	2	2	13	1	11	8	1	6
8	2	63	8	14	5120	97	35	62	-	-	-	-	-	-	-	-	-	-	-
9	4	63	9	26	5110	136	45	91	1	10	19	2	1	15	1	5	3	1	6

ESTIMATED

CHEMICAL, PHYSICAL AND BACTERIOLOGICAL ANALYSES

STATE ALABAMA

MAJOR BASIN TENNESSEE RIVER

MINOR BASIN TENN. RIVER-MAIN STEM & MINOR TRIB.

STATION LOCATION TENNESSEE RIVER AT BRIDGEPORT, ALABAMA 77

DATE OF SAMPLE			TEMP. (Degrees Centigrade)	DISSOLVED OXYGEN mg/l	pH	B.O.D. mg/l	C.O.D. mg/l	CHLORINE DEMAND		AMMONIA-NITROGEN mg/l	CHLORIDES mg/l	ALKALINITY mg/l	HARDNESS mg/l	COLOR (cobalt units)	TURBIDITY (silica units)	SULFATES mg/l	PHOSPHATES mg/l	TOTAL DISSOLVED SOLIDS mg/l	COLIFORMS per 100 ml.
MONTH	DAY	YEAR						1-HOUR mg/l	24-HOUR mg/l										
10	10	62	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2000
10	24	62	18.5	6.1	7.3	1.4	8	1.7	3.4	.0	20	55	75	5	12	21	-	118	11000
11	7	62	13.8	7.8	7.3	1.9	9	1.8	3.7	.0	19	48	70	10	11	21	-	101	22000
11	21	62	12.8	8.2	7.3	1.6	11	2.1	3.8	.0	14	56	70	10	10	19	-	117	750
12	5	62	11.8	8.6	7.4	1.3	13	1.9	3.7	.0	17	44	62	10	9	19	-	111	2200
12	20	62	6.5	10.0	7.4	1.7	13	2.1	4.3	.0	22	59	81	10	8	28	-	132	5000
1	2	63	5.0	10.8	7.4	2.0	11	1.5	3.7	.0	12	50	68	15	14	18	-	94	1400
1	16	63	5.0	10.8	7.1	1.5	8	1.5	3.8	.0	-	49	73	15	16	23	-	108	2000
1	30	63	3.5	11.2	7.3	1.6	8	2.0	5.0	.0	18	56	72	30	21	21	-	105	1700
2	13	63	4.0	10.9	7.4	2.6	35	1.8	4.8	.0	16	51	69	10	22	28	-	118	900
2	27	63	4.0	11.2	7.4	2.4	3	2.2	4.7	.0	11	56	72	15	21	25	-	146	1100
3	13	63	11.5	10.5	7.2	2.0	22	3.2	7.4	.0	5	24	31	15	510	18	-	46	4400
3	27	63	11.5	11.4	7.4	3.3	12	2.6	5.5	.0	9	55	71	10	98	16	-	80	4800
4	10	63	14.0	8.5	7.3	1.4	12	1.6	3.8	.0	5	50	71	10	37	18	-	106	5400
4	24	63	17.0	7.8	7.4	2.8	12	1.9	3.9	.0	7	56	73	20	32	17	-	116	10000
5	8	63	19.0	7.5	7.4	2.3	10	2.1	3.9	.0	8	48	62	10	25	16	-	86	1400
5	22	63	20.9	6.6	7.4	1.5	15	1.9	3.7	.0	9	51	68	15	20	20	-	94	4900
6	5	63	21.0	6.8	7.4	1.9	8	1.8	3.8	.0	7	50	66	25	14	16	-	120	3400
6	19	63	24.0	5.0	7.3	1.3	9	1.8	3.4	.0	10	48	66	15	13	17	-	85	5200
7	3	63	24.0	5.7	7.4	2.1	13	1.7	3.5	.0	11	53	73	15	10	20	-	118	150
7	17	63	24.0	5.4	7.4	1.5	13	.8	2.3	.0	7	54	67	10	14	23	-	122	4000
7	31	63	24.5	5.6	7.5	1.0	12	2.0	4.2	.0	8	51	64	15	18	16	-	98	4000
8	14	63	24.5	5.3	7.4	5.9	16	1.8	3.3	.1	8	51	63	5	9	16	-	114	11000
8	28	63	26.0	5.2	7.0	1.3	10	2.0	-	.0	10	46	59	10	-	12	-	90	7500
9	11	63	25.0	5.5	7.2	1.7	12	1.9	2.2	.0	14	46	62	15	-	16	-	92	3200
9	25	63	22.0	5.9	7.4	4.1	9	1.4	-	.0	18	51	72	10	-	15	-	113	5000

FISH POPULATION

State: Alabama
Major basin: Tennessee River
Minor basin: Tennessee River—Main stem and minor tributaries
Station location: Tennessee River at Bridgeport, Ala.

		Collecting method											
		Electric shocker						Trammel net					
Sampling date(s)		June 12 and 13, 1963						June 12, 1963					
Total number of fish		739						23					
Total weight of fish (pounds)		115.0						45.8					
Group	Species collected	Percent of total		Length range (inches) number of fish				Percent of total		Length range (inches) number of fish			
		Number	Weight	0–4	5–8	9–12	Over 12	Number	Weight	0–4	5–8	9–12	Over 12
I	Spotted gar	0.3	1.2										
	Longnose gar							8.7	16.7				
	Shortnose gar	.3	2.8					4.3	3.0				
	Skipjack	.1	<.1					13.0	5.8				
	White bass	.3	.2					8.7	3.6				
	Largemouth bass	2.0	13.4										
	Spotted bass	2.0	1.5										
	White crappie	1.6	2.2					4.3	.8				
	Sauger	.4	.6										
		7.0	21.9					39.0	29.9				
II	Emerald shiner	38.5	2.0										
	Ribbon shiner	.3	<.1										
	Spotfin shiner	12.0	.4										
	Steelcolor shiner												
	Fathead minnow	.1	<.1										
	Longear sunfish	.7	.2										
	Redear sunfish	.7	.6										
	Bluegill	10.8	3.4										
	Warmouth	.3	.5										
	Logperch	.9	.1										
	Brook silversides	.1	<.1										
		64.4	7.2										

FISH POPULATION—Continued

State: Alabama
Minor basin: Tennessee River
Minor basin: Tennessee River—Main stem and minor tributaries
Station location: Tennessee River at Bridgeport, Ala.

		Collecting method											
		Electric shocker						Trammel net					
Sampling date(s)		June 12 and 13, 1963						June 12, 1963					
Total number of fish		739						23					
Total weight of fish (pounds)		115.0						45.8					
Group	Species collected	Percent of total		Length range (inches) number of fish				Percent of total		Length range (inches) number of fish			
		Number	Weight	0–4	5–8	9–12	Over 12	Number	Weight	0–4	5–8	9–12	Over 12
III	Gizzard shad	25.7	39.3										
		25.7	39.3										
IV	Freshwater drum	.7	2.6										
		.7	2.6										
V	River carpsucker	.4	5.9					26.3	31.6				
	Spoted sucker	.1	.7										
		.5	6.6					26.3	31.6				
VI	Carp	.9	12.9										
	Bigmouth buffalo							4.3	10.8				
	Smallmouth buffalo	.8	9.5					17.4	17.9				
	Channel catfish							8.7	7.4				
	Flathead catfish							4.3	2.4				
		1.7	22.4					34.7	38.5				

STREAM FLOW DATA - 1962-1963

Thousand Cubic Feet per Second

PROVISIONAL--SUBJECT TO REVISION

Gaging Station at Hales Bar near Chattanooga, Tennessee
Operated by U.S. Geological Survey

STATE Alabama

MAJOR BASIN Tennessee River

MINOR BASIN Tennessee River-Main Stem & Minor Trib.

STATION LOCATION Tennessee River at Bridgeport, Alabama

Day	October	November	December	January	February	March	April	May	June	July	August	September
1	27.800	30.800	42.300	38.000	37.800	19.800	24.800	74.400	20.900	20.900	31.900	20.100
2	28.400	30.800	43.500	33.000	32.800	24.000	27.900	60.200	10.100	27.700	32.100	20.100
3	28.900	33.600	44.400	39.600	44.700	24.700	32.900	52.100	21.900	23.900	23.000	25.200
4	28.400	33.400	45.400	40.600	54.200	15.700	30.600	42.500	27.600	14.200	21.800	30.700
5	28.500	34.000	46.000	26.200	43.900	33.900	33.700	24.000	28.700	21.500	28.100	30.400
6	27.600	33.200	46.300	25.200	40.500	81.000	31.200	34.100	28.400	25.200	29.600	30.600
7	28.100	32.700	46.100	30.800	38.000	151.000	29.700	26.300	28.500	18.200	24.700	25.900
8	28.000	33.200	44.400	36.000	43.500	146.000	32.100	23.300	24.100	25.900	28.400	24.200
9	28.000	36.600	39.000	33.700	44.900	118.000	25.900	24.400	21.800	26.700	30.300	32.100
10	27.800	39.900	41.000	30.100	44.400	103.000	23.900	21.800	26.900	26.900	30.200	32.200
11	27.700	38.200	44.400	36.400	45.800	83.500	26.600	17.400	31.100	26.100	31.500	31.500
12	28.200	36.400	43.200	42.100	45.400	69.000	23.300	19.200	32.900	27.700	28.600	30.600
13	27.900	35.200	42.000	46.500	44.000	215.000	34.300	14.000	21.800	25.700	30.100	29.300
14	28.000	35.300	33.300	32.600	44.600	213.000	29.900	24.200	22.900	25.900	29.800	31.400
15	28.300	35.100	29.000	40.700	41.100	206.000	21.900	26.600	26.600	28.000	29.300	21.900
16	28.400	33.900	23.100	40.800	40.400	201.000	25.500	28.300	20.800	28.700	22.800	33.000
17	29.500	33.000	31.000	32.400	21.000	192.000	18.600	25.700	26.800	28.400	23.500	32.100
18	30.800	35.000	25.400	27.700	36.300	162.000	21.500	30.100	24.800	29.500	20.800	28.700
19	30.800	35.600	29.000	27.900	44.300	142.000	21.200	22.200	32.300	30.200	23.300	30.100
20	31.000	35.800	29.300	33.800	36.400	133.000	21.000	32.200	32.900	26.900	28.900	32.600
21	31.800	33.100	34.800	42.700	29.800	126.000	25.900	34.900	28.800	29.400	31.200	33.500
22	31.200	41.200	31.100	36.900	47.100	109.000	16.400	39.500	12.700	31.500	31.100	36.000
23	31.500	43.300	27.000	30.100	47.000	107.000	24.100	35.800	8.800	30.000	31.400	29.200
24	30.600	43.300	39.200	38.000	33.100	86.000	23.400	27.000	14.700	30.100	30.400	30.200
25	31.300	42.400	34.000	40.600	27.900	64.300	26.900	22.400	20.400	22.400	30.500	28.000
26	30.900	41.900	33.800	31.100	23.700	61.800	36.800	16.700	19.500	23.200	30.500	27.000
27	30.700	42.500	40.600	17.100	30.900	57.500	41.200	28.600	20.600	27.400	29.100	23.300
28	30.600	42.400	30.500	42.400	29.300	45.400	31.700	27.500	19.200	20.800	31.000	24.900
29	31.300	42.300	36.300	43.600		34.400	29.100	25.300	23.700	28.200	31.200	28.400
30	31.300	42.600	44.700	37.300		28.400	54.800	18.800	15.200	32.100	24.700	31.500
31	30.600		38.100	44.000		25.600		22.400		31.800	20.800	

TENNESSEE RIVER AT CHATTANOOGA, TENNESSEE

Samples are collected at the municipal water treatment plant intake. This station is in the tailwaters of TVA's Chickamauga Lake and is located approximately 48 river miles upstream from the Alabama-Tennessee State line. Hales Bar Dam is located at river mile 431, approximately 34 miles downstream from the sampling point.

Principal pollution sources above the station are a chemical plant producing fertilizers, a mineral recovery operation and two commercial sand dredging operations which create occasional turbidity problems.

The river serves as a source of municipal supply for the city of Chattanooga. Approximately 40-45 million gallons a day is used by industry for cooling purposes.

There is some commercial trot-line fishing for catfish in the area, and a considerable amount of bank fishing by local residents.

Station Location:	Tennessee River at Chattanooga, Tennessee
Major Basin:	Tennessee River
Minor Basin:	Tennessee River-Main Stem and Minor Tributary
Station at:	35°03' Latitude 85°18' Longitude
Miles above mouth:	465
Activation Date:	March 12, 1958
Sampled by:	City Water Company of Chattanooga
Field Analysis by:	City Water Company of Chattanooga Tennessee Valley Authority
Other Cooperating Agencies:	Tennessee Department of Public Health
Hydrologic Data:	
Nearest pertinent gaging station:	At Chattanooga, Tennessee
Gaging station operated by:	U.S. Geological Survey
Drainage area at gaging station:	21,400 square miles
Period of record:	1874 to present
Average discharge in record period:	37,110 cfs.
Maximum discharge in record period:	410,000 cfs.
Minimum discharge in record period:	1,200 cfs. (daily)
Remarks:	Flow regulated by reservoir operations.

ALKYL BENZENE SULFONATE (ABS)

Date	mg/l

ELEMENTAL ANALYSES

		Composite Interval 10/1/62 to 12/31/62	Composite Interval 4/1/63 to 6/30/63
Analysis by wet or flame methods. Results in mg/l	F	.21	*.01
	Na	10	5.6
	K	1.7	1.0
Analysis by Spectrographic methods. Results in micrograms per liter	Zn	*3	20
	Cd	*1	*2
	As	*13	*10
	B	15	3
	P	*3	*4
	Fe	17	2
	Mo	*1	*4
	Mn	*.6	*.8
	Al	–	*4
	Be	*.03	*.02
	Cu	8	2
	Ag	*.3	*.2
	Ni	*1	*2
	Co	*3	*2
	Pb	*3	*2
	Cr	*1	*2
	V	*1	*4
	Ba	35	6
	Sr	70	9

*Actual value is less than the amount shown. Reported result indicates limit of sensitivity at which test was performed. See text for explanation.

STRONTIUM 90 ACTIVITY

Composite Interval	pc/l	±	Composite Interval	pc/l	±
October to December	1.4	.3	April to June	1.7	.3
January to March	2.6	.5	July to September	3.3	.5

± at 95% Confidence Limits

SPECIFIC QUALITATIVE IDENTIFICATIONS FROM CARBON ADSORPTION EXTRACTS WATER YEAR 1962-3

Interval	Compound	Concentration* ug/l

*Concentration values, where shown, are calculated from quantitative gas chromatographic analysis of the aromatic fractions of CCE, and may be assigned the units of ug/l. In light of the unknown efficiency of carbon adsorption sampling for these compounds, the reported values represent minima, the actual values being equal to or greater than the reported values.
See page 21.

RADIOACTIVITY DETERMINATIONS

STATE TENNESSEE

MAJOR BASIN TENNESSEE RIVER

MINOR BASIN TENN. RIVER-MAIN STEM & MINOR TRIB.

STATION LOCATION TENNESSEE RIVER AT CHATTANOOGA, TENNESSEE 51

DATE SAMPLE TAKEN			RADIOACTIVITY IN WATER														RADIOACTIVITY IN PLANKTON					
			DATE OF DETERMINATION		ALPHA						BETA						DATE OF DETERMINATION		GROSS ACTIVITY			
					SUSPENDED		DISSOLVED		TOTAL		SUSPENDED		DISSOLVED		TOTAL				ALPHA		BETA	
NO.	DAY	YR.	NO.	DAY	pc/l	±	pc/l	±	pc/l	±	pc/l	±	pc/l	±	pc/l	±	NO.	DAY	pc/g	±	pc/g	±
10	3	62	11	2	-	-	-	-	-	-	3	6	9	7	12	9						
10	17	62	11	6	0	1	0	1	0	1	10	6	30	8	40	10						
10	31	62	11	26	-	-	-	-	-	-	8	3	37	4	45	5						
11	14	62	12	4	0	1	0	1	0	1	23	6	42	7	65	9						
11	28	62	12	21	-	-	-	-	-	-	9	6	66	8	75	10						
12	12	62	1	4	0	0	1	1	1	1	13	6	47	7	60	9						
1	9	63	1	21	0	1	0	1	0	1	5	3	49	4	54	4						
1	23	63	2	6	-	-	-	-	-	-	12	6	27	6	39	8						
2	6	63	2	20	2	1	0	1	2	1	36	7	40	8	76	11						
2	20	63	3	7	1	1	0	1	1	1	55	8	73	9	128	12						
3	6	63	3	25	23	9	1	1	24	9	435	30	68	4	503	30						
3	20	63	4	8	2	1	1	1	3	1	42	4	27	3	69	5						
4	3	63	4	16	2	1	4	1	6	1	20	7	35	7	55	10						
4	17	63	5	1	0	1	1	1	1	1	1	6	30	8	31	10						
5	1	63	5	20	8	3	0	1	8	3	245	10	102	4	347	11						
5	8	63	5	27	0	0	0	1	0	1	25	3	35	3	60	4						
5	15	63	5	31	0	0	0	0	0	0	16	4	36	4	52	6						
5	22	63	6	7	0	1	0	1	0	1	20	6	32	7	52	9						
5	29	63	6	12	0	0	0	0	0	0	18	6	33	7	51	9						
6	12	63	7	1	0	0	0	1	0	1	5	3	37	4	42	5						
6	19	63	7	3	0	1	0	1	0	1	14	7	38	8	52	11						
6	26	63	7	10	0	0	0	0	0	0	10	5	45	8	55	9						
7	3	63	9	9	0	1	0	1	0	1	13	3	28	4	41	5						
7	10	63	7	24	0	0	1	1	1	1	5	6	36	8	41	10						
7	17	63	8	7	0	1	0	1	0	1	8	6	29	7	37	9						
7	24	63	8	12	0	-	0	1	0	1	5	3	28	3	33	4						
7	30	63	8	19	1	1	0	0	1	1	16	3	37	4	53	5						
8	7	63	8	19	0	1	0	0	0	1	4	3	36	4	40	5						
8	14	63	8	27	0	1	0	1	0	1	5	6	27	6	32	9						
8	21	63	9	6	0	1	0	0	0	1	8	6	33	7	41	9						
8	28	63	9	17	0	1	0	0	0	1	2	6	33	8	35	10						
9	4	63	9	20	1	1	0	0	1	1	0	4	24	6	24	7						
9	11	63	10	2	0	0	0	1	0	1	0	8	26	8	26	11						
9	18	63	10	1	1	1	0	1	1	1	2	3	18	5	20	6						
9	25	63	10	14	0	0	1	1	1	1	1	3	18	3	19	4						

PLANKTON POPULATION

STATE TENNESSEE

MAJOR BASIN TENNESSEE RIVER

MINOR BASIN TENN. RIVER-MAIN STEM & MINOR TRIB.

STATION LOCATION TENNESSEE RIVER AT CHATTANOOGA, TENNESSEE 051

DATE OF SAMPLE			DOMINANT SPECIES OF DIATOMS AND PERCENT OF TOTAL DIATOMS (Bio test for Codes)									FUNGI AND SHEATHED BACTERIA Number per ml.	MICROINVERTEBRATES																			
			1ST		2ND		3RD		4TH				PROTOZOA (Ciliates/Flagellates) Number per ml.	ROTIFERS										CRUSTACEA								
															GENERA AND COUNT LEVEL (Bio test for Codes)												GENERA AND COUNT LEVEL (Bio test for Codes)							
															1ST		2ND		3RD		4TH		5TH				1ST		2ND		3RD			
MONTH	DAY	YEAR	SPECIES	PERCENT	SPECIES	PERCENT	SPECIES	PERCENT	SPECIES	PERCENT	OTHER SPECIES PERCENT			NUMBER PER LITER	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	NUMBER PER LITER	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	SHEATHED BACTERIA (Filaments) Number per liter	OTHER NATURAL FOODS (Number per liter)
10	1	62	56	26	57	19	82	13	58	9	33	0	0	60	11	4	17	1							0						0	0
10	15	62	56	31	57	15	82	13	26	12	29	0	0	7	11	1									0						0	0
11	5	62	56	40	58	36	57	8	82	3	13	0	0	3											0						0	0
11	19	62	56	14	62	9	58	8	16	6	63	0	0	0											0						0	0
12	3	62	56	36	57	23	58	11	82	6	24	30	0	1											0						0	0
12	17	62	57	42	56	31	80	8	82	4	15	0	0	3											0						0	0
1	7	63	57	61	56	17	97	10	82	4	8	0	0	3											0						0	0
1	21	63	92	18	62	16	71	13	57	12	41	0	0	0											0						0	0
2	4	63	57	37	92	7	71	4	56	4	48	0	0	0											0						0	0
2	18	63	57	30	56	19	82	11	92	7	33	0	0	1											0						0	0
3	4	63	57	28	92	25	61	10	36	8	29	0	-	34	17	2	11	1	21	1					1						0	0
3	18	63	61	22	92	14	62	11	36	8	45	0	-	0											0						0	0
4	1	63	57	27	58	24	9	19	71	3	27	0	-	0											0						0	0
4	15	63	57	39	56	11	82	10	61	9	31	0	-	39	21	3	17	2							0						1	0
5	6	63	14	21	92	12	31	10	82	9	48	-	-	1											0						0	0
5	20	63										-	-	-											-						-	-
6	3	63	56	30	58	23	57	21	47	4	22	-	-	3											2						0	0
6	17	63	58	48	56	13	82	10	95	9	20	-	-	12	21	1									15	73	2	50	2		0	0
7	1	63	56	25	47	19	58	19	95	8	29	-	-	34	17	2	11	2							0						0	0
7	15	63	56	29	95	24	58	18	47	12	17	-	-	45	11	3	17	2	16	1					1						2	0
8	5	63	56	45	92	14	95	8	57	4	29	-	-	50	11	3	17	2	16	1					1						0	0
8	19	63	56	45	92	18	58	17	89	4	16	-	-	137	17	4	11	4	21	1	16	1			9	50	2				0	0
9	3	63	56	35	58	12	27	11	92	9	33	-	-	47	17	3	11	2							5	50	1				0	0
9	16	63	56	18	23	14	58	12	92	11	45	-	-	39	11	2	17	2	22	1					7	51	1				0	0

PLANKTON POPULATION

STATE TENNESSEE

MAJOR BASIN TENNESSEE RIVER

MINOR BASIN TENN. RIVER-MAIN STEM & MINOR TRIB.

STATION LOCATION TENNESSEE RIVER AT CHATTANOOGA, TENNESSEE 51

DATE OF SAMPLE			ALGAE (Number per milliliter)									INERT DIATOM SHELLS		MOST ABUNDANT ALGAE - Genera and Count Level per ml. (Use text for Codes)																	
			TOTAL	BLUE-GREEN		GREEN		FLAGELLATED (Pigmented)		DIATOMS				1ST		2ND		3RD		4TH		5TH		6TH		7TH		8TH		9TH		10TH	
MONTH	DAY	YEAR		COCCOID	FILAMENTOUS	COCCOID	FILAMENTOUS	GREEN	OTHER	CENTRIC	PENNATE	CENTRIC	PENNATE	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL
10	1	62	500	0	0	170	40	40	120	120	40	40	40																		
10	15	62	300	0	0	80	0	10	0	140	90	10	40																		
11	5	62	400	40	0	40	0	120	0	80	80	0	0																		
11	19	62	100	0	0	0	0	0	0	80	30	30	90																		
12	3	62	100	0	0	0	0	0	0	110	20	30	20																		
12	17	62	300	0	0	20	0	0	0	230	40	0	40																		
1	7	63	400	0	0	40	0	20	0	330	40	180	40	69	1																
1	21	63	500	0	0	20	0	0	20	260	220	20	220	69	1																
2	4	63	300	0	20	0	0	0	0	200	40	110	90	69	1																
2	18	63	400	20	0	0	0	0	70	130	180	70	40																		
3	4	63	1100	0	0	0	0	20	70	700	290	20	90	71	3																
3	18	63	200	0	10	0	0	30	0	40	110	30	100																		
4	1	63	200	0	0	0	0	20	0	40	110	20	110																		
4	15	63	400	0	0	0	0	70	140	130	10	60	40																		
5	6	63	100	0	0	0	0	20	20	40	20	40	70																		
5	20	63	200	0	0	0	0	0	80	100	10	10	40																		
6	3	63	200	0	0	30	0	0	60	70	70	0	30																		
6	17	63	100	0	0	30	0	30	0	30	20	50	50																		
7	1	63	100	0	0	40	0	0	0	40	40	0	20																		
7	15	63	200	0	20	40	0	20	40	70	20	40	0																		
8	5	63	500	0	140	40	0	60	0	170	120	60	80																		
8	19	63	400	20	20	60	0	80	0	150	80	40	20																		
9	3	63	300	0	0	90	0	40	20	90	20	110	0																		
9	16	63	200	0	0	50	0	0	0	70	50	50	90																		

ORGANIC CHEMICALS

RECOVERED BY CARBON FILTER TECHNIQUE

RESULTS IN MICROGRAMS PER LITER
(Parts per billion)

STATE: TENNESSEE
MAJOR BASIN: TENNESSEE RIVER
MINOR BASIN: TENN. RIVER-MAIN STEM & MINOR TRIB.
STATION LOCATION: TENNESSEE RIVER AT CHATTANOOGA, TENNESSEE 51

DATE OF SAMPLE BEGINNING MONTH	DAY	YEAR	END MONTH	DAY	GALLONS FILTERED	EXTRACTABLES TOTAL	CHLORO-FORM	ALCOHOL	ETHER INSOLUBLES	WATER SOLUBLES	CHLOROFORM EXTRACTABLES NEUTRALS TOTAL	ALIPHATICS	AROMATICS	OXYGEN-ATED COMPOUNDS	LOSS	WEAK ACIDS	STRONG ACIDS	BASES	LOSS
10	10	62	10	17	4440	150	47	103	-	-	-	-	-	-	-	-	-	-	-
11	14	62	11	23	5660	105	44	61	-	-	-	-	-	-	-	-	-	-	-
12	12	62	12	24	5160	151	43	108	-	-	-	-	-	-	-	-	-	-	-
12	12	62		*	15260	134	45	89	2	10	18	1	2	15	0	6	3	1	5
1	9	63	1	16	4290	180	48	132	-	-	-	-	-	-	-	-	-	-	-
2	13	63	2	20	3610	166	46	120	2	10	20	1	2	15	2	6	3	1	4
3	13	63	3	20	3460	138	39	99	1	8	17	2	2	13	0	4	2	1	6
4	11	63	4	17	3960	98	28	70	1	6	13	2	1	9	1	3	1	1	3
5	8	63	5	15	3780	183	92	91	-	-	-	-	-	-	-	-	-	-	-
6	12	63	6	19	4800	148	84	64	3	17	36	10	5	20	1	9	8	1	10
7	11	63	7	18	4440	109	51	58	-	-	-	-	-	-	-	-	-	-	-
8	14	63	8	21	4100	138	70	68	4	19	21	2	3	15	1	7	8	1	10
9	11	63	9	18	4390	112	41	71	-	-	-	-	-	-	-	-	-	-	-

CHEMICAL, PHYSICAL AND BACTERIOLOGICAL ANALYSES

STATE TENNESSEE

MAJOR BASIN TENNESSEE RIVER

MINOR BASIN TENN. RIVER-MAIN STEM & MINOR TRIB.

STATION LOCATION TENNESSEE RIVER AT CHATTANOOGA, TENNESSEE 51

DATE OF SAMPLE			TEMP. (Degrees Centigrade)	DISSOLVED OXYGEN mg/l	pH	B.O.D. mg/l	C.O.D. mg/l	CHLORINE DEMAND		AMMONIA-NITROGEN mg/l	CHLORIDES mg/l	ALKALINITY mg/l	HARDNESS mg/l	COLOR (units)	TURBIDITY (units)	SULFATES mg/l	PHOSPHATES mg/l	TOTAL DISSOLVED SOLIDS mg/l	COLIFORMS per 100 ml.
MONTH	DAY	YEAR						1-HOUR mg/l	24-HOUR mg/l										
10	2	62	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	900
10	3	62	21.3	6.3	7.5	1.0	11	1.6	4.0	.0	19	46	78	5	28	16	-	132	-
10	16	62	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3800
10	17	62	22.4	5.9	7.3	1.1	9	1.7	3.3	.0	18	49	76	5	15	18	-	102	-
10	30	62	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1600
10	31	62	16.8	7.5	7.4	1.7	10	1.7	3.5	.0	12	47	76	5	10	18	-	113	-
11	13	62	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	20000
11	14	62	12.9	8.6	7.3	2.8	11	1.9	3.8	.0	10	46	74	7	15	18	-	110	-
11	27	62	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1400
11	28	62	11.2	9.1	7.4	1.8	11	1.7	3.9	.0	11	52	70	5	16	21	-	116	-
12	11	62	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1300
12	12	62	6.7	9.9	7.3	2.1	11	2.2	4.7	.0	16	52	80	8	16	27	-	121	-
12	24	62	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	500
12	26	62	6.2	10.3	7.3	2.1	14	2.7	5.5	.0	14	71	94	7	34	22	-	121	-
1	8	63	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	24000
1	9	63	5.6	10.7	7.3	1.6	12	1.7	4.6	.0	19	55	82	4	10	21	-	111	-
1	22	63	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	13000
1	23	63	5.6	11.0	7.3	1.5	11	2.5	5.2	.0	11	61	80	8	20	16	-	116	-
2	5	63	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	8700
2	6	63	5.6	11.1	7.3	1.4	12	2.0	4.6	.0	8	57	72	6	20	20	-	113	-
2	19	63	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	870
2	20	63	4.5	11.0	7.3	2.2	32	2.8	5.9	.0	7	59	78	10	28	21	-	108	-
3	5	63	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5000
3	6	63	7.3	9.0	7.1	5.6	28	3.6	-	.0	3	44	62	15	410	20	-	78	-
3	19	63	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3400
3	20	63	12.3	10.7	7.2	3.7	12	2.2	5.9	.0	6	51	68	10	160	18	-	104	-
4	2	63	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	730
4	3	63	14.5	9.2	7.3	2.3	9	2.1	4.4	.0	9	60	76	4	52	16	-	92	-
4	16	63	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1000
4	17	63	15.7	8.0	7.4	3.4	12	1.8	3.7	.0	6	61	80	4	29	17	-	111	-
4	29	63	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	43000
5	1	63	15.7	7.3	7.2	5.6	27	3.8	-	.0	3	26	44	25	140	15	-	52	-
5	15	63	20.2	6.4	7.3	2.4	9	2.2	4.1	.0	8	45	66	6	17	16	-	93	-
5	28	63	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	9000
5	29	63	20.2	7.0	7.4	.9	8	1.9	3.8	.0	6	48	64	7	28	13	-	86	-
6	11	63	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1500
6	12	63	23.5	5.4	7.4	.8	9	1.8	3.5	.0	7	46	64	6	16	22	-	86	-
6	25	63	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	7700
6	26	63	23.0	5.4	7.3	1.3	12	1.3	3.1	.0	9	52	68	6	17	21	-	101	-

CHEMICAL, PHYSICAL AND BACTERIOLOGICAL ANALYSES

STATE TENNESSEE

MAJOR BASIN TENNESSEE RIVER

MINOR BASIN TENN. RIVER-MAIN STEM & MINOR TRIB.

STATION LOCATION TENNESSEE RIVER AT CHATTANOOGA, TENNESSEE 51

DATE OF SAMPLE			TEMP. (Degrees Centigrade)	DISSOLVED OXYGEN mg/l	pH	B.O.D. mg/l	C.O.D. mg/l	CHLORINE DEMAND		AMMONIA-NITROGEN mg/l	CHLORIDES mg/l	ALKALINITY mg/l	HARDNESS mg/l	COLOR (units)	TURBIDITY (units)	SOLIDS mg/l	PHOSPHATES mg/l	TOTAL DISSOLVED SOLIDS mg/l	COLIFORMS per 100 ml.
MONTH	DAY	YEAR						1-HOUR mg/l	24-HOUR mg/l										
7	9	63	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	30000
7	10	63	25.2	5.4	7.3	2.8	11	2.3	4.5	.0	6	53	70	6	21	18	-	101	-
7	23	63	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	32000
7	24	63	25.8	5.6	7.4	2.2	13	1.5	2.1	.0	7	48	70	7	25	16	-	106	-
8	6	63	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2100
8	7	63	26.9	5.5	7.3	2.3	10	1.9	4.2	.0	6	53	60	7	15	16	-	128	-
8	20	63	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
8	21	63	25.8	5.8	7.6	1.3	17	1.8	3.5	.0	7	50	64	6	5	11	-	95	-
9	3	63	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	930
9	4	63	25.8	5.5	7.5	1.8	11	1.8	3.9	.0	8	50	70	6	5	14	-	112	-
9	17	63	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
9	18	63	24.8	6.0	7.4	2.4	16	1.6	3.1	.0	15	50	70	5	10	13	-	122	-

STREAM FLOW DATA - 1962-1963

Thousand Cubic Feet per Second

PROVISIONAL--SUBJECT TO REVISION

Gaging Station at Chattanooga, Tennessee
Operated by U.S. Geological Survey

STATE Tennessee

MAJOR BASIN Tennessee River

MINOR BASIN Tennessee River-Main Stem & Minor Trib.

STATION LOCATION Tennessee River at Chattanooga, Tennessee

Day	October	November	December	January	February	March	April	May	June	July	August	September
1	28.100	31.500	41.700	37.300	30.700	18.300	23.100	57.000	18.600	23.000	31.800	19.300
2	27.500	31.400	43.900	31.400	28.000	23.300	26.700	52.400	12.600	30.600	32.500	23.300
3	26.000	32.600	43.200	39.100	40.300	22.500	31.700	47.300	21.700	26.700	22.200	25.600
4	27.700	34.400	47.200	39.000	50.500	13.600	31.800	36.200	27.000	18.800	22.300	31.600
5	26.800	32.400	46.100	22.100	38.000	28.700	31.700	21.900	27.700	27.400	28.200	31.100
6	30.000	33.100	46.600	23.400	36.700	74.300	26.300	32.700	27.800	26.400	30.900	30.000
7	27.900	32.200	46.200	30.900	36.300	119.000	25.300	22.900	27.500	15.800	24.800	27.100
8	29.000	33.400	45.100	35.000	42.600	136.000	29.700	21.200	22.100	28.100	29.000	23.800
9	27.800	34.700	38.400	31.300	44.100	115.000	22.700	16.600	22.000	28.700	29.100	30.300
10	28.600	36.600	41.500	28.400	43.100	103.000	23.800	20.500	26.000	28.100	30.600	33.900
11	28.100	35.800	44.300	38.400	47.600	71.300	26.700	15.800	33.500	27.700	30.700	32.800
12	28.400	34.600	43.600	37.900	43.700	129.000	21.400	19.200	31.600	29.000	29.500	31.600
13	27.900	34.500	42.600	43.700	42.800	210.000	33.800	14.700	23.900	29.500	30.900	32.300
14	28.400	34.300	32.300	30.200	44.200	210.000	26.400	24.600	23.400	25.600	31.400	29.400
15	29.300	34.400	28.100	41.000	41.500	209.000	22.100	30.000	19.500	30.200	30.000	24.900
16	29.000	32.400	22.600	41.200	39.600	210.000	23.200	26.300	22.400	28.700	26.300	32.400
17	29.900	31.900	28.200	29.300	20.800	196.000	18.300	27.000	28.000	28.400	26.200	30.500
18	31.800	33.700	24.300	28.600	36.800	160.000	21.200	32.700	28.700	29.100	11.700	28.200
19	32.900	34.600	28.800	26.800	43.500	143.000	23.800	21.400	30.700	29.500	25.400	32.200
20	31.400	33.900	30.700	32.900	34.000	138.000	20.900	31.800	29.200	23.000	30.700	30.000
21	30.400	32.900	34.900	41.200	28.700	127.000	26.200	36.500	25.900	28.700	32.100	33.400
22	31.800	41.400	29.300	36.000	45.800	114.000	16.800	40.800	14.400	31.400	33.100	30.700
23	32.500	39.300	26.600	28.000	45.300	109.000	26.200	33.900	13.000	30.200	32.200	30.700
24	32.900	40.000	39.100	39.400	30.900	85.200	23.200	28.000	14.200	30.000	31.300	29.000
25	30.900	41.300	30.300	42.700	27.700	63.500	30.000	26.100	20.500	23.600	28.900	25.700
26	32.300	43.300	34.300	29.900	22.200	60.500	36.600	17.100	19.400	24.800	30.400	27.300
27	30.600	42.200	30.500	21.500	33.300	52.000	40.000	27.300	23.300	25.700	31.200	21.200
28	31.900	42.000	27.200	43.200	27.600	42.200	27.700	28.000	17.200	22.600	31.700	26.900
29	31.800	41.200	35.100	40.300		30.700	21.400	28.700	22.700	23.700	31.600	26.900
30	30.400	41.800	43.900	33.200		25.500	41.000	16.800	11.700	31.300	26.600	30.200
31	30.400		33.000	40.900		24.800		18.300		31.700	16.200	

FISH POPULATION

State: Tennessee
Major basin: Tennessee River
Minor basin: Tennessee River—Main stem and minor tributaries
Station location: Tennessee River at Chattanooga, Tenn.

		Collecting method											
		Rotenone						Electric shocker					
Sampling date(s)		July 18, 1963						July 17, 1963					
Total number of fish		637						563					
Total weight of fish (pounds)		159.6						132.0					
Group	Species collected	Percent of total		Length range (inches) number of fish				Percent of total		Length range (inches) number of fish			
		Number	Weight	0–4	5–8	9–12	Over 12	Number	Weight	0–4	5–8	9–12	Over 12
I	Longnose gar							0.5	1.3				
	Shortnose gar							.5	3.0				
	Skipjack	2.7	1.1	1	13	3		.2					
	White bass	7.4	3.2	32	10	4	1	.4	.3				
	Spotted bass							.9	.4				
	Largemouth bass	2.5	1.0	3	13			4.4	9.1				
	White crappie	.3	.2		2			.2	.2				
	Sauger	.2	.2			1							
		13.1	5.7					7.1	14.3				
II	Mooneye	.3	.7			2		.5	1.3				
	Silver chub	.9	.2		6								
	Golden shiner	.2	.1		1								
	Emerald shiner	7.5	.3	48				20.4	.9				
	Spotfin shiner							2.0	.1				
	Mimic shiner	2.2		14									
	Undetermined minnow	.2			1								
	Green sunfish	.2		1				.7	.1				
	Pumpkinseed							1.1	.8				
	Bluegill	14.7	3.4	70	25			45.9	12.5				
	Longear sunfish	1.2	.4	3	5			3.2	.8				
	Redear sunfish	2.1	1.3	2	10	1		2.5	1.5				
	Hybrid sunfish	.3	.1		2			1.2	.6				

FISH POPULATION—Continued

State: Tennessee
Major basin: Tennessee River
Minor basin: Tennessee River—Main stem and minor tributaries
Station location: Tennessee River at Chattanooga, Tenn.

		Collecting method											
		Rotenone						Electric shocker					
Sampling date(s)		July 18, 1963						July 17, 1963					
Total number of fish		637						563					
Total weight of fish (pounds)		159.6						132.0					
Group	Species collected	Percent of total		Length range (inches) number of fish				Percent of total		Length range (inches) number of fish			
		Number	Weight	0–4	5–8	9–12	Over 12	Number	Weight	0–4	5–8	9–12	Over 12
II	Logperch	1.6	0.1	10				0.7					
	Brook silversides	.2		1									
		31.6	6.6					78.2	18.6				
III	Gizzard shad	37.5	45.2		32	206	2	11.7	13.0				
	Threadfin shad	1.6	.1	10									
		39.1	45.3					11.7	13.0				
IV	Black redhorse	.2	.8				1						
	Golden redhorse	.5	2.4		1		2						
	Freshwater drum	5.0	2.2	9	21	2							
		5.7	5.4										
V	River carpsucker	.5	3.6				3						
	Quillback carpsucker	.2	1.4				1						
	White sucker	.5	.1		3								
	Spotted sucker	3.3	15.2		2	4	15	.9	5.8				
		4.5	20.3					.9	5.8				
VI	Carp	.5	3.2			2	1	1.4	40.0				
	Smallmouth buffalo	.6	6.1		1		3	.7	8.3				
	Channel catfish	4.7	7.1	1	17	3	9						
	Flathead catfish	.2	.3			1							
		6.0	16.7					2.1	48.3				

736-496 O - 64 - 15

TENNESSEE RIVER AT LENOIR CITY, TENNESSEE

Samples are collected at the municipal water treatment plant intake. This station is one mile below and in the tail-race of Ft. Loudon Dam. It is almost directly opposite the mouth of a major tributary, the Little Tennessee River. The Little Tennessee River probably has little influence on the characteristics of the water as measured at the sampling point.

The city of Knoxville, Tennessee, 50 miles upstream, discharges treated municipal wastes with a BOD population equivalent of 315,000. The 45 mile reach of Ft. Loudon Reservoir modifies these wastes to the extent that no effect is apparent at Lenoir City.

The river sustains extensive recreational use with fishing, boating, and swimming on Ft. Loudon Reservoir, and excellent seasonal fisheries for sauger, walleye and white bass in the tailwaters of the dam.

Bottom samples were collected on April 3 and July 24, 1963. In protected areas where soft clay is deposited, limited numbers of worms, midge larvae, and unionoid clams were found. The Asiatic clam (Corbicula fluminea) was common.

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Station Location:	Tennessee River at Lenoir City, Tennessee
Major Basin:	Tennessee River
Minor Basin:	Tennessee River - Main Stem and Minor Tributary
Station at:	35°47' Latitude 84°15' Longitude
Miles above mouth:	601
Activation Date:	January 30, 1962
Sampled by:	Lenoir City Water Utilities Board
Field Analysis by:	Lenoir City Water Utilities Board U.S. Public Health Service
Other Cooperating Agencies:	Tennessee Department of Public Health Tennessee Stream Pollution Control Commission
Hydrologic Data:	
Nearest pertinent gaging station:	Tennessee River at Ft. Loudon, Tenn. and Little Tenn. River near McGhee, Tenn.
Gaging station operated by:	Tennessee Valley Authority
Drainage area at gaging station:	–
Period of record:	Little Tenn. River - 1904 to present Ft. Loudon Dam - 1943 to present
Average discharge in record period:	–

Maximum discharge in record period: –

Minimum discharge in record period: –

Remarks: Flow computed as sum of Little Tennessee at McGhee, Tenn. plus Tennessee River at Ft. Loudon Dam. Both rivers regulated by upstream reservoirs.

ALKYL BENZENE SULFONATE (ABS)

Date	mg/l

ELEMENTAL ANALYSES

		Composite Interval 10/1/62 to 12/31/62	Composite Interval 4/1/63 to 6/30/63
Analysis by wet or flame methods. Results in mg/l	F	.27	.15
	Na	21	8.3
	K	2.1	1.2
Analysis by Spectrographic methods. Results in micrograms per liter	Zn	18	*2
	Cd	*2	*2
	As	*18	*12
	B	12	7
	P	*9	*6
	Fe	107	4
	Mo	*2	6
	Mn	.4	1.2
	Al	–	41
	Be	*.05	*.03
	Cu	22	7
	Ag	*.4	*.3
	Ni	*1	*2
	Co	*4	*2
	Pb	*9	*3
	Cr	*1	4
	V	*2	*6
	Ba	38	11
	Sr	70	20

*Actual value is less than the amount shown. Reported result indicates limit of sensitivity at which test was performed. See text for explanation.

STRONTIUM 90 ACTIVITY

Composite Interval	pc/l	±	Composite Interval	pc/l	±
October to December	1.0	.2	April to June	1.5	.2
January to March	–	–	July to September	–	–

± at 95% Confidence Limits

SPECIFIC QUALITATIVE IDENTIFICATIONS FROM CARBON ADSORPTION EXTRACTS WATER YEAR 1962-3

Interval	Compound	Concentration* ug/l

*Concentration values, where shown, are calculated from quantitative gas chromatographic analysis of the aromatic fractions of CCE, and may be assigned the units of ug/l. In light of the unknown efficiency of carbon adsorption sampling for these compounds, the reported values represent minima, the actual values being equal to or greater than the reported values.

See page 21.

RADIOACTIVITY DETERMINATIONS

STATE TENNESSEE

MAJOR BASIN TENNESSEE RIVER

MINOR BASIN TENN. RIVER-MAIN STEM & MINOR TRIB.

STATION LOCATION TENNESSEE RIVER AT LENOIR CITY, TENNESSEE 107

DATE SAMPLE TAKEN			RADIOACTIVITY IN WATER														RADIOACTIVITY IN PLANKTON					
			DATE OF DETERMINATION		ALPHA						BETA						DATE OF DETERMINATION		GROSS ACTIVITY			
					SUSPENDED		DISSOLVED		TOTAL		SUSPENDED		DISSOLVED		TOTAL				ALPHA		BETA	
MO.	DAY	YR.	MO.	DAY	pc/l	±	pc/l	±	pc/l	±	pc/l	±	pc/l	±	pc/l	±	MO.	DAY	pc/g	±	pc/g	±
10	1	62	10	24	0	1	0	1	0	1	0	5	8	7	8	9						
10	8	62	11	1	0	0	0	1	0	1	2	5	8	7	10	9						
10	15	62	11	8	0	0	0	0	0	0	3	8	7	6	10	10						
10	22	62	11	13	0	0	0	1	0	1	0	5	6	3	6	6						
10	29	62	11	21	0	1	1	1	1	1	12	6	15	8	27	10						
11	5	62	11	28	1	19	0	19	1	27	5	5	9	7	14	9						
11	12	62	1	3	0	1	0	1	0	1	16	7	27	8	43	11						
11	19	62	12	6	0	0	0	0	0	0	5	6	18	7	23	9						
11	26	62	12	18	0	0	0	1	0	1	11	6	40	8	51	10						
12	3	62	12	31	0	1	0	1	0	1	7	3	11	4	18	5						
12	10	62	1	3	0	1	0	1	0	1	8	6	17	8	25	10						
12	17	62	1	7	0	0	0	0	0	0	5	4	16	5	21	6						
12	24	62	1	10	-		-	-	-	-	7	6	14	9	21	11						
12	31	62	1	14	0	1	0	1	0	1	13	3	16	5	29	6						
1	8	63	1	21	0	0	0	1	0	1	13	3	19	4	32	5						
1	14	63	1	25	1	1	0	0	1	1	20	7	16	7	36	10						
1	21	63	1	30	0	1	0	1	0	1	12	7	18	8	30	11						
1	28	63	2	14	0	0	1	1	1	1	17	6	32	8	49	10						
2	5	63	2	18	1	1	0	0	1	1	40	4	26	4	66	6						
2	11	63	3	1	1	1	0	1	1	1	33	7	46	9	79	11						
2	18	63	3	4	1	2	2	2	3	2	22	4	22	4	44	6						
3	4	63	3	22	0	1	0	1	0	1	32	7	22	7	54	10						
3	11	63	3	25	2	2	0	1	2	2	77	9	22	4	99	10						
3	18	63	4	8	4	2	2	1	6	2	38	7	22	4	60	8						
3	26	63	4	8	4	2	0	1	4	2	45	5	15	3	60	6						
4	29	63	6	3*	0	.	1	1	1	1	17	4	18	4	35	6						
5	27	63	6	24*	0	1	0	1	0	1	9	3	17	4	26	5						
6	24	63	8	6*	1	1	0	0	1	1	10	6	9	7	19	9						
7	29	63	9	9*	0	1	0	0	0	1	9	3	13	4	22	5						
8	27	63	10	10*	1	1	0	1	1	1	2	5	17	7	19	9						
9	30	63	11	20*	0	1	0	1	0	1	3	5	17	7	20	9						

PLANKTON POPULATION

STATE TENNESSEE
MAJOR BASIN TENNESSEE RIVER
MINOR BASIN TENN. RIVER-MAIN STEM & MINOR TRIB.
STATION LOCATION TENNESSEE RIVER AT
LENOIR CITY, TENNESSEE 107

DATE OF SAMPLE			DOMINANT SPECIES OF DIATOMS AND PERCENT OF TOTAL DIATOMS (See text for Codes)									FUNGI AND SHEATHED BACTERIA Number per ml.	PROTOZOA (Identifiable) Number per ml.	MICROINVERTEBRATES: ROTIFERS											MICROINVERTEBRATES: CRUSTACEA							NEMATODES (Identifiable) Number per liter	OTHER ANIMAL FORMS (Number per liter)
			1ST		2ND		3RD		4TH					NUMBER PER LITER	GENERA AND COUNT LEVEL (See text for Codes): 1ST		2ND		3RD		4TH		5TH		NUMBER PER LITER	GENERA AND COUNT LEVEL (See text for Codes): 1ST		2ND		3RD			
MONTH	DAY	YEAR	SPECIES	PERCENT	SPECIES	PERCENT	SPECIES	PERCENT	SPECIES	PERCENT	OTHER SPECIES PERCENT				GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL		GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL		
10	1	62	57	31	27	21	56	10	82	6	32	-	-	71	11	4	17	2	18	1					3	50	1					0	0
10	15	62	57	38	28	9	23	8	96	4	41	-	-	.99	11	4	17	3							11	50	2	77	1			0	0
11	5	62	57	23	27	22	2	9	91	5	41	-	0	69	11	4									3	50	1					0	0
11	19	62	57	33	56	10	95	7	58	6	44	-	-	0											0							0	0
12	3	62	57	15	56	11	31	8	82	7	59	30	0	1											0							0	0
12	17	62	57	44	56	15	27	6	58	5	30	90	-	207	11	5	17	4	21	3					0							0	0
1	9	63	57	60	82	11	92	4	58	4	21	-	-	0											0							0	0
1	21	63	57	70	82	6	71	5	64	3	16	-	-	3											0							0	0
2	5	63	57	60	82	13	65	3	62	3	21	-	-	26	17	2	21	1							0							0	0
2	18	63										-	-	-											-							-	-
3	4	63	57	63	82	14	61	5	9	4	14	-	-	3											1							0	0
3	18	63	65	15	36	15	57	12	92	10	48	-	0	20	17	1	21	1							1							0	0
4	1	63	57	37	9	5	31	5	62	5	48	-	-	0											0							0	0
4	15	63	82	47	57	15	9	5	64	3	30	-	-	1											0							0	0
5	6	63										-	-	-											-							-	-
5	20	63	58	89	82	4	95	3	89	1	3	-	-	-											-							-	-
6	3	63	58	47	56	34	82	3	9	3	13	-	-	-											-							-	-
6	19	63	56	29	58	15	67	7	82	7	42	-	-	-											-							-	-
7	1	63	82	32	58	16	56	6	96	6	40	-	-	-											-							-	-
7	15	63										-	-	-											-							-	-
8	5	63	27	57	91	8	89	6	58	4	25	-	-	-											-							-	-
8	19	63	28	27	57	26	82	8	58	7	32	-	-	-											-							-	-
9	3	63	27	28	91	25	57	8	82	5	34	-	-	-											-							-	-
9	16	63	82	36	27	29	57	8	91	5	22	-	-												-							-	-

PLANKTON POPULATION

STATE TENNESSEE

MAJOR BASIN TENNESSEE RIVER

MINOR BASIN TENN. RIVER-MAIN STEM & MINOR TRIB.

STATION LOCATION TENNESSEE RIVER AT

LENOIR CITY, TENNESSEE 107

DATE OF SAMPLE			ALGAE (Number per milliliter)									INERT DIATOM SHELLS		MOST ABUNDANT ALGAE - Genera and Count Level per ml. (See text for Codes)																	
			TOTAL	BLUE-GREEN		GREEN		FLAGELLATED (Pigmented)		DIATOMS				1ST		2ND		3RD		4TH		5TH		6TH		7TH		8TH		9TH		10TH	
MONTH	DAY	YEAR		COCCOID	FILAMENTOUS	COCCOID	FILAMENTOUS	GREEN	OTHER	CENTRIC	PENNATE	CENTRIC	PENNATE	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL	GENUS	COUNT LEVEL
10	1	62	600	0	0	40	0	40	0	210	290	40	80	68	1																
10	15	62	600	40	0	170	0	60	0	210	120	0	0																		
11	5	62	500	0	0	0	0	0	0	330	120	0	0	69	1																
11	19	62	200	0	0	20	0	30	0	120	0	110	60																		
12	3	62	200	0	0	0	0	0	0	90	60	50	90																		
12	17	62	300	0	0	0	0	50	0	260	20	50	30	69	1																
1	9	63	200	0	20	20	0	30	0	120	20	0	50																		
1	21	63	600	0	0	0	0	20	0	510	20	20	220	69	2	71	1														
2	5	63	200	0	0	0	0	20	0	180	0	40	90																		
2	18	63	100	0	30	0	0	20	50	20	20	20	80																		
3	4	63	500	0	0	0	0	40	130	180	180	90	40	77	1																
3	18	63	500	0	0	0	0	20	70	110	350	20	240	77	1																
4	1	63	300	0	40	0	0	0	0	80	150	80	60																		
4	15	63	100	0	0	0	0	0	0	60	30	60	80																		
5	6	63	00	0	0	0	0	0	0	0	30	0	20																		
5	20	63	400	0	0	0	0	0	0	440	0	40	40	69	2																
6	3	63	400	0	40	20	0	0	0	250	40	20	60	69	1																
6	19	63	200	0	0	0	0	50	0	50	70	70	90																		
7	1	63	300	0	0	70	0	0	0	90	110	0	70																		
7	15	63	500	0	0	100	0	60	0	150	150	100	80	44	1																
8	5	63	300	0	40	170	0	20	0	60	40	170	100																		
8	19	63	1000	50	170	170	0	30	0	300	320	470	100	69	1																
9	3	63	1100	90	240	200	0	70	0	150	320	390	300																		
9	16	63	1300	20	20	270	0	110	0	360	480	290	290	81	1																

ORGANIC CHEMICALS

RECOVERED BY CARBON FILTER TECHNIQUE

RESULTS IN MICROGRAMS PER LITER
(Parts per billion)

STATE TENNESSEE

MAJOR BASIN TENNESSEE RIVER

MINOR BASIN TENN. RIVER-MAIN STEM & MINOR TRIB.

STATION LOCATION TENNESSEE RIVER AT
LENOIR CITY, TENNESSEE 107

DATE OF SAMPLE BEGINNING MONTH	DAY	YEAR	END MONTH	DAY	GALLONS FILTERED	EXTRACTABLES TOTAL	CHLORO-FORM	ALCOHOL	CHLOROFORM EXTRACTABLES ETHER INSOLUBLES	WATER SOLUBLES	NEUTRALS TOTAL	ALIPHATICS	AROMATICS	OXYGEN-ATED COMPOUNDS	LOSS	WEAK ACIDS	STRONG ACIDS	BASES	LOSS
10	1	62	11	4	4500#	134	32	102	1	9	12	1	1	9	1	4	2	1	3
12	13	62	1	6	2650#	144	39	105	-	-	-	-	-	-	-	-	-	-	-
1	6	63	2	18	3190	58	15	43	1	3	8	2	1	4	1	1	1	0	1
2	18	63	4	8	*	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5	1	63	6	3	2250#	99	36	63	3	10	12	3	1	8	0	4	3	2	2
6	4	63	7	2	*	-	-	-	-	-	-	-	-	-	-	-	-	-	-
7	3	63	8	5	*	-	-	-	-	-	-	-	-	-	-	-	-	-	-
8	15	63	9	1	1120	291	122	169	6	36	43	6	6	28	3	12	9	2	14
9	1	63	9	18	2450	132	49	83	2	14	17	3	2	11	1	6	3	1	6
9	18	63	10	2	2120	152	42	110	1	11	16	3	2	10	1	4	2	1	7

ESTIMATED

* FLOW UNKNOWN

CHEMICAL, PHYSICAL AND BACTERIOLOGICAL ANALYSES

STATE TENNESSEE

MAJOR BASIN TENNESSEE RIVER

MINOR BASIN TENN. RIVER-MAIN STEM & MINOR TRIB.

STATION LOCATION TENNESSEE RIVER AT LENOIR CITY, TENNESSEE 107

DATE OF SAMPLE			TEMP. (Degrees Centigrade)	DISSOLVED OXYGEN mg/l	pH	B.O.D. mg/l	C.O.D. mg/l	CHLORINE DEMAND		AMMONIA-NITROGEN mg/l	CHLORIDES mg/l	ALKALINITY mg/l	HARDNESS mg/l	COLOR (units)	TURBIDITY (units)	SULFATES mg/l	PHOSPHATES mg/l	TOTAL DISSOLVED SOLIDS mg/l	COLIFORMS per 100 ml.
MONTH	DAY	YEAR						1-HOUR mg/l	24-HOUR mg/l										
11	11	62	14.0	-	7.0	-	-	2.4	-	-	-	-	-	-	-	-	-	-	-
7	15	63	-	-	-	-	-	-	-	-	19	76	100	5	*25	32	.0	143	-
7	22	63	-	-	-	-	-	-	-	-	6	30	48	5	*25	7	.0	80	-
7	29	63	-	-	-	-	-	-	-	-	11	52	76	0	*25	20	.0	102	-
8	5	63	-	-	-	-	-	-	-	-	20	66	90	0	*25	20	.0	138	-
8	15	63	-	-	-	-	-	-	-	-	22	68	92	0	*25	19	.0	131	-
8	19	63	-	-	-	-	-	-	-	-	31	70	100	0	*25	21	.0	173	-
8	27	63	-	-	-	-	-	-	-	-	38	70	110	0	*25	24	.0	168	-
9	9	63	-	-	-	-	-	-	-	-	34	76	100	5	*25	21	.0	176	-
9	16	63	-	-	-	-	-	-	-	-	35	80	108	5	*25	23	.0	176	-
9	23	63	-	-	-	-	-	-	-	-	36	68	100	5	*25	26	.0	179	-
9	30	63	-	-	-	-	-	-	-	-	36	68	100	5	*25	27	.0	175	-

FISH POPULATION

State: Tennessee
Major basin: Tennessee River
Minor basin: Tennessee River—Main stem and minor tributaries
Station location: Tennessee River at Lenoir City, Tenn.

		Collecting method											
		Rotenone						Electric shocker					
Sampling date(s)		July 23, 1963						July 23 and 24, 1963					
Total number of fish		218						161					
Total weight of fish (pounds)		34.8						27.1					
Group	Species collected	Percent of total		Length range (inches) number of fish				Percent of total		Length range (inches) number of fish			
		Number	Weight	0–4	5–8	9–12	Over 12	Number	Weight	0–4	5–8	9–12	Over 12
I	Longnose gar							0.6	4.9				
	Skipjack	1.9	5.4			2	2						
	White bass							3.7	3.8				
	Smallmouth bass							10.6	7.3				
	Spotted bass							6.2	12.1				
	White crappie	3.8	.1	8				1.9	.1				
	Sauger	15.5	7.7	24	6	3	1						
		21.2	13.2					23.0	28.2				
II	Mooneye	.9	2.1			2							
	Silver chub	5.5	1.2	12									
	Emerald shiner	4.6	.6	10				.6	.1				
	Spotfin shiner	8.7	.5	19				3.7	.2				
	Bullhead minnow	2.8	.1	6									
	Redbreast sunfish							16.2	14.1				
	Bluegill	1.9	.8	3	1			31.1	17.8				
	Logperch	.9	.1	1	1								
		25.3	5.4					51.6	32.2				

FISH POPULATION—Continued

State: Tennessee
Major basin: Tennessee River
Minor basin: Tennessee River—Main stem and minor tributaries
Station location: Tennessee River at Lenoir City, Tenn.

		Collecting method											
		Rotenone						Electric shocker					
Sampling date(s)		July 23, 1963						July 23 and 24, 1963					
Total number of fish		218						161					
Total weight of fish (pounds)		34.8						27.1					
Group	Species collected	Percent of total		Length range (inches) number of fish				Percent of total		Length range (inches) number of fish			
		Number	Weight	0–4	5–8	9–12	Over 12	Number	Weight	0–4	5–8	9–12	Over 12
III	Gizzard shad	6.9	16.9	.....	.....	15	.....	6.8	14.1	.....	.....	.....	.....
	Threadfin shad	32.3	1.0	71	.....	.....	.....	16.8	.5	.....	.....	.....	.....
		39.2	17.9	.....	.....	.....	.....	23.6	14.6	.....	.....	.....	.....
IV	Golden redhorse	2.8	14.7	.....	2	1	3	.....	.....	.....	.....	.....	.....
	Freshwater drum	10.1	20.4	.....	17	4	1	.6	8.3	.....	.....	.....	.....
		12.9	35.1	.....	.....	.....	.....	.6	8.3	.....	.....	.....	.....
V	Carp	1.4	28.4	.....	.....	.....	3	.6	9.1	.....	.....	.....	.....
	Smallmouth buffalo	.....	.....	.....	.....	.....	.....	.6	7.6	.....	.....	.....	.....
		1.4	28.4	.....	.....	.....	.....	1.2	16.7	.....	.....	.....	.....

STREAM FLOW DATA - 1962-1963

Thousand Cubic Feet per Second

PROVISIONAL--SUBJECT TO REVISION

Computed Data for Lenoir City, Tennessee
Data Furnished by Tennessee Valley Authority
Through U.S. Geological Survey

STATE: Tennessee

MAJOR BASIN: Tennessee River

MINOR BASIN: Tennessee River-Main Stem & Minor Trib

STATION LOCATION: Tennessee River at Lenoir City, Tennessee

Day	October	November	December	January	February	March	April	May	June	July	August	September
1	11.800	18.400	29.200	17.200	13.800	8.950	13.900	15.800	9.600	11.200	12.000	6.020
2	18.900	17.500	25.300	18.600	15.500	6.490	20.300	6.900	6.230	11.600	10.200	[illegible]560
3	16.000	16.700	27.700	20.400	30.500	10.600	28.700	2.550	10.900	11.700	6.980	18.900
4	11.200	12.600	27.500	22.600	18.100	7.810	30.000	3.320	12.300	5.760	3.560	16.100
5	6.210	17.800	30.600	13.600	13.000	12.800	32.500	2.[illegible]40	10.900	6.360	16.500	19.300
6	9.290	17.500	30.500	16.500	9.060	55.500	27.800	8.520	13.300	7.560	19.100	21.800
7	10.300	20.000	26.700	19.900	13.000	56.300	21.800	14.300	15.100	4.630	16.000	18.200
8	18.500	18.400	28.000	13.600	18.200	44.300	23.100	7.480	13.400	14.100	18.300	13.200
9	19.100	23.800	21.000	16.500	14.600	39.900	24.400	17.300	8.760	13.600	18.800	19.100
10	16.300	12.300	25.400	16.200	18.800	38.600	24.900	12.100	13.300	11.700	16.500	20.400
11	20.800	11.200	26.000	17.800	22.900	37.800	26.400	7.320	14.700	13.000	15.200	21.200
12	15.500	12.900	31.100	25.000	23.300	98.100	24.700	6.830	8.380	12.600	22.400	24.200
13	12.200	11.500	29.600	16.500	20.500	115.000	20.600	10.400	11.800	10.700	19.900	22.400
14	11.900	9.790	15.200	16.200	19.600	80.400	18.600	14.500	9.950	8.320	17.100	20.400
15	12.700	13.100	7.950	18.000	19.200	71.000	19.000	13.000	7.060	10.600	15.300	13.200
16	17.000	12.800	8.140	14.200	23.000	71.600	27.000	18.900	6.840	16.500	17.900	24.900
17	18.400	12.900	12.400	15.300	9.020	67.100	26.100	15.400	6.960	10.800	15.800	20.200
18	20.300	10.200	15.100	13.900	10.400	64.900	21.700	20.300	9.030	21.400	14.200	17.700
19	20.400	14.400	15.900	11.200	18.600	65.100	20.000	14.000	13.700	19.200	19.200	17.400
20	21.300	21.000	16.300	11.000	5.570	70.400	17.400	20.500	20.000	7.070	18.600	21.600
21	20.500	17.500	18.200	17.100	22.900	67.300	13.500	21.600	18.800	9.750	17.600	23.300
22	20.600	16.900	16.600	15.000	31.600	55.300	14.800	24.600	3.820	9.320	18.000	15.700
23	20.600	24.800	12.300	12.600	15.400	38.000	16.900	27.900	1.990	10.700	20.000	21.400
24	20.100	21.100	12.800	23.400	9.610	32.100	20.900	25.300	9.750	9.530	23.500	22.100
25	20.200	15.500	13.700	18.700	14.400	28.100	23.900	10.600	7.660	7.810	18.100	20.600
26	21.500	19.000	23.400	9.830	10.400	23.800	23.800	6.770	7.920	13.100	20.600	19.000
27	19.400	25.000	15.100	12.700	18.300	17.500	20.700	8.850	8.540	6.560	20.100	18.000
28	16.200	24.700	10.600	22.800	7.010	12.700	16.800	4.220	11.500	3.320	21.300	14.500
29	19.000	26.000	14.300	22.200		12.200	11.500	8.110	3.620	14.400	18.600	16.100
30	23.500	27.600	7.220	19.100		11.200	21.700	9.990	3.640	18.800	8.250	13.800
31	17.500		12.000	15.900		10.700		8.560		12.700	7.400	

Computed as sum of Little Tennessee River at McGhee, Tennessee plus the sum of the Tennessee River at Fort Loudon, Tennessee.

U. S. GOVERNMENT PRINTING OFFICE : 1964 O - 736-486